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GENERAL ATOMIC

DIVISION OF GENERAL DYNAMICS

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METALLIC EQUATIONS OF STATE FOR HYPERVELOCITY IMPACT

by

J. H. Tillotson

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GENERAL ATOMIC

DIVISION OF

GENERAL DYNAMICS

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(6) METALLIC EQUATIONS OF STATE FOR HYPERVELOCITY IMPACT*

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CONTENTS

I. INTRODUCTION

A prime requirement in the calculation of hypervelocity impact is an accurate thermodynamic description, or equation of state, of the nteracting materials through a wide range of pressure and density. This state equation must describe not only normal-density material and its condition after shock, but also its expansion and change of phase in cases where the shock energy has been sufficient to melt or v porize. At high pressures (above about 10 megabars) a useful equation of state can be derived by means of the Thomas-Fermi statiztical theory of the atom. Although this theory gives poor results at lower pressures because of its incorrect treatment of partial ionization, considerable low-pressure data are available from shock-wave experiments. A single equation, valid in both pressure regions and having a relatively simple format, should be expected to provide an accurate basis for the solution of hypervelocity impact problems.

For this reason, considerable effort has been devoted, as a prelude to numerical impact calculations, to formulating from available theoretical and experimental data a library of metallic equations of state. This report presents a general equation of state having specific internal energy and specific volume as independent variables for nine metallic elements in analytic, tabular, and graphic form. The elements are W, Cu, Fe, Al, Be, Ni, Mo, Th, and Ti. Comparisons between Thomas-Fermi theory and shock-wave experiments are shown in the graphs.

In this report, "low pressure" generally means from 0 to about 10 megabars and "high pressure" from 10 to about 1000 megabars. The peak pressure of impact for a tungsten projectile striking a tungsten target at a velocity of 10^6 cm/sec is nearly 10 megabars and at 10^7 cm/sec is approximately 900 megabars. Consequently, any pressure attainable by present laboratory techniques is by definition "low." On the other hand, in the

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realm of meteorite impact, for which this equation is also valid, "high" shock pressures will certainly exist.

II. LOW-PRESSURE EQUATION OF STATE

In the low-pressure region, explosive shock-wave experiments by McQueen and Marsh,[1] by Rice, et al.,[2] and by Walsh and Christian[3] provide data up to pressures of about 2 megabars. For some metals recent Soviet experiments by Al'tshuler, et al.,[4] have extended the peak pressures to 4 and 5 megabars. These data agree to within a few per cent with values extrapolated from McQueen's measurements, and depending upon the accuracy desired, such extrapolations can be used to extend all McQueen's experimental Hugoniot limits to 5 megabars. This procedure has been adopted in formulating all Hugoniot equations in the low-pressure region.

If impact velocities are such that peak shock pressure are below 10 megabars, a Mie-Grüneisen equation of state of the following form adequately completes the thermodynamic description of the material:

$$P - P_0 = \frac{G}{V} (E - E_0) . \tag{1}$$

In this relation P_0 and E_0 are the pressure and specific internal energy at $0°$ reference temperature, and G, the Grüneisen coefficient, is a function only of the volume. By differentiating Eq. (1), the Grüneisen coefficient can be defined as

$$G(V) = V \left(\frac{\partial P}{\partial E} \right)_V = \frac{V}{C_V} \left(\frac{\partial P}{\partial T} \right)_V . \tag{2}$$

The first expression is particularly useful, as in the present calculations, since the independent variables are specific internal energy and specific volume (E, V). Solution of Eq. (2) gives a modified Mie-Grüneisen equation of the form

$$P = G(V) \frac{E}{V} + f(V) . \tag{3}$$

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*References are listed on page 139.

This expression is equivalent to Eq. (1), except for a function of integration f(V), which is determined by substitution of the Hugoniot pressure and energy relations into Eq. (3). This procedure is used in Appendix A to d rive a low-pressure equation of state that is useful from 0 to about 5 megabars. Equation (3), however, proved to be the most amenable relation for developing a single equation of state for both low and high pressures.

III. HIGH-PRESSURE EQUATION OF STATE

The Thomas-Fermi and Thomas-Fermi-Dirac statistical theories of the atom have been modified extensively for both temperature dependence and exchange effects in the search for an equation of state for compressed materials.[5, 6, 7] A very complete description of this method given by Cowan and Ashkin[8] includes both temperature dependence and exchange effects, but lacks sufficient computed results. Latter,[9] on the other hand, has presented a more adequate display of data, but his calculations neglect exchange effects and are limited to high temperatures. It is possible, however, to correct both Thomas-Fermi and Thomas-Fermi-Dirac low-temperature data by use of the experimental shock-wave measurements discussed in Section II. As a result, Thomas-Fermi results can then be used through an extended range of pressure with a greater degree of confidence.

In the low-pressure region, Eq. (3) is a good equation of state for solids, but as the energy increases, the assumption that the Grüneisen coefficient is a function only of the volume can no longer be justified. This is evident from the Thomas-Fermi calculation of the variation of pressure with energy at constant volume and can also be observed in the behavior of $(PV/E + 1)$, which is a qualitative measure of how similar a material is to an ideal gas at a given temperature (or energy). For shock compressions less than the asymptotic value, a single-variable representation of G from Thomas-Fermi results would be quite difficult mathematically as well as

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being exceedingly tenuous thermodynamically Although any pair of thermo-
dynamic variables would prove sufficient, the most convenient for the
present use are specific internal energy and volume. For completeness,
it can easily be shown that a Grüneisen coefficient of two variables $G(E, V)$
is compatible with Grüneisen's postulates for zero pressure. In the
Mie-Grüneisen theory for a monatomic solid, the thermal pressure of a
crystal lattice is given by

$$P_T = \frac{\gamma E_T}{V} .$$
(4)

where γ is defined as the negative relative variation of the characteristic
temperature (or of the lattice frequency from $\theta = h\nu/k$) with the volume,
i. e., $\gamma = - (\partial \ln \theta/\partial \ln V)$. In Eq. (4) consider γ a function of both energy
and volume, and then differentiate with respect to energy. This gives

$$\left(\frac{\partial P_T}{\partial E_T} \right)_V = \frac{\gamma}{V} + \frac{E_T}{V} \left(\frac{\partial \gamma}{\partial T} \right)_V \frac{1}{C_V} .$$
(5)

If the second term on the right-hand side can be neglected, this is equivalent
to Eq. (2) At zero pressure, where the thermal energy is zero (and T = 0),
the equation strictly satisfies Grüneisen's postulate that γ (or G for bulk
material) is independent of temperature. [10]

The analytic equations of state presented in this report provide a
best-fit extrapolation between Thomas-Fermi-Dirac data[11] at high
pressures (above 50 megabars) and experimental data at low pressures.
These equations are quite sufficient for impact pressures of 0 to about
1000 megabars and are accurate to within 3% to 5% below 5 megabars and
within 10% for all other pressures. As an example, the isentropic expansion
of tungsten that has been shocked to 590 megabars produces a pressure of
46 megabars at $V = V_0$ according to Thomas-Fermi calculations. The
computed pressure from the tungsten formulation is 49 megabars, an error
of only 6.5%.

IV. REGIONS OF INTEREST ON THE P, V, E SURFACE

The impact interaction for which the equations of state are valid is limited to an adiabatic process. This is in accordance with the so-called ballistic model of impact.[12] The equations do not provide for extraneous heat or energy sources during the compression, or shock, phase of the interaction, and the subsequent expansion of material is isentropic. The compression is governed entirely by the Hugoniot conditions, which are necessarily consistent with conservation of mass, energy, and momentum. Specifically, the equations of state have not been formulated for strong isentropic compressions from any source whatever.

The formulation has two independent variables in the form $P(E, V)$, where E and V are the specific internal energy and specific volume, respectively. In the P, V plane, the regions of interest are shown in Fig. 1. For reasons discussed in the previous paragraph, Region I to the left of the Hugoniot curve (high isentropic compressions), is excluded from the formulation. Region II represents the compressed phase of the material and extends vertically to shock pressures of about 1000 megabars. Region III describes material that has been shocked to an energy less than the sublimation energy and will, therefore, return to zero pressure as a solid. There is no provision in the formulation for describing material under tension, as would be indicated by a negative pressure. (A useful numerical procedure would be to set negative pressures equal to zero). Region IV is the expansion phase of the material and is represented by an equation different from that of Region II but continuous in pressure and its derivatives across the change-of-phase line. This change of phase line is placed conveniently at $V = V_0$ for energies greater than the sublimation energy. For large specific volumes, the formulation for Region IV extrapolates to an ideal-gas limit.
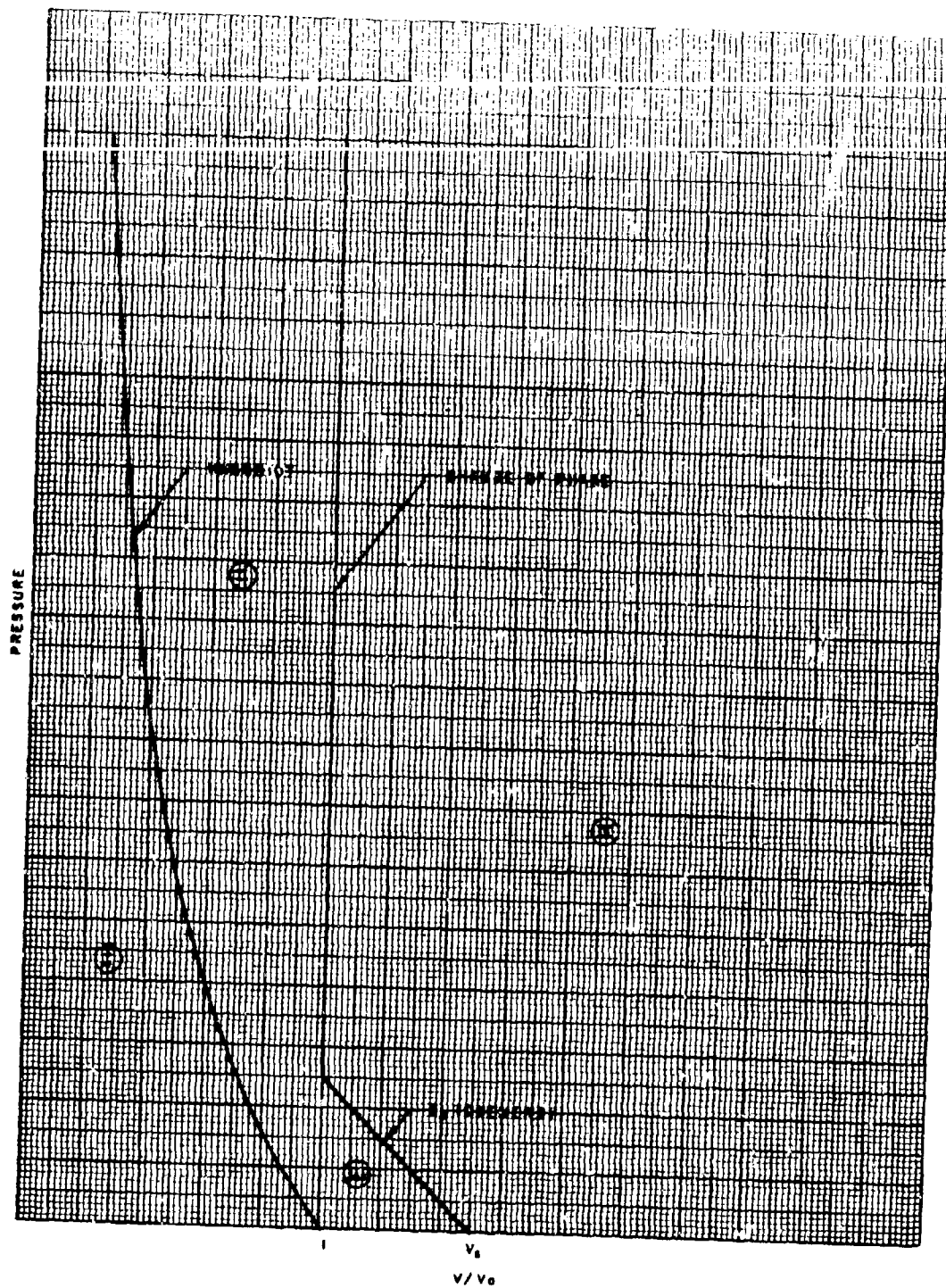
Fig. 1--The P, V plane showing the regions of interest

FORMULATION OF THE EQUATION-OF-STATE DATA

The equation of state presented in this report has the same basic format for all metals and differs among the various metals only by choice of numerical constants. For compressed material, there are five constants used in the formulation, three of which are determined directly from material properties. The remaining two are then adjusted numerically by an IBM-7090 computer code to arrive at an optimum fit of the data. The code provides for computing as many as twenty materials or twenty variations of parameters during a single run. Two other constants are added for the expansion phase to ensure proper behavior of the equation. The mathematical expressions for the equation of state, with limits and constants obtained for each metal along with their graphic presentation, are given in Appendix B. For each metal, a Hugoniot curve with five isentropes and five isoenergy curves are calculated and listed in tables of pressure (P), normalized volume (V/V_0), and specific internal energy (E), which are reproduced for reference in Appendix C. The analytic equations and a discussion of the choice of constants for Regions II, III, and IV are presented below.

REGION II

The equation of state for Region II has the form

$$P = \left(a + \frac{b}{\dfrac{E}{E_0 \eta^2} + 1} \right) \frac{E}{V} + A\mu + B\mu^2 , \qquad (6)$$

where P = the pressure in megabars,

E = the specific internal energy in megabars-cm^3/g,

V = $1/\rho$, the specific volume in cm^3/g,

$\eta = \rho/\rho_0 = V_0/V$, where ρ_0 is the normal density, and

$\mu = \eta - 1$.

The constants a, b, and A are derived _a priori_ to fit special equation-of-state data for each material. E_0 and B are then adjusted to provide the best over-all P, V, E surface. The basic form of this equation is P = $G(E, V)E\rho + f(V)$, which is a generalization of Eq. (3) with an energy- and volume-dependent Grüneisen coefficient. The volume-dependent terms equivalent to $f(V)$ are derived from the behavior at low pressures.

At zero pressure on the Hugoniot curve, which coincides with the zero-energy reference state, A must be equivalent to $\rho_0 C^2$. In this relation, C is the speed of sound determined from shock measurements, which give the shock speed, U_s, in terms of the particle velocity, U_p; i. e.,

$$U_s = C + SU_p .\tag{7}$$

where S is an experimental constant. At $U_p = 0$, the shock speed is sonic and equals the experimental constant C. Although less consistent, an alternate value for C is the "adiabatic sound speed," $C^2 = (\partial P/\partial\rho)_s$, which is calculated from data of Bridgman[13] and appropriate thermodynamic data. For materials undergoing a polymorphic change of phase, the U_s versus U_p relation of Eq. (7) no longer adequately represents the data, so the alternative value of C is perhaps preferable. The value of C used in calculating A should be consistent with the low-pressure data, since the slope of the Hugoniot curve at zero energy is proportional to $(\partial P/\partial\rho)_s = C^2$. With a proper choice of C, the Hugoniot curve then has a correct slope at the zero reference state.

The Grüneisen coefficient, G_0, at zero pressure is used to determine b from the condition that $a + b = G_0$. The value of a is independently obtained from the asymptotic Thomas-Fermi value of the variation of pressure with energy at maximum compression; i. e., an asymptotic Grüneisen coefficient. At very high energies, this provides a measure of the ideal-gas-like behavior of the material. In nearly all cases, a = 0.5, which gives a fivefold compression for the volume asymptote. The Hugoriot pressures of all the metallic elements presented here actually

overshoot the "true" asymptotic value but then, at high energies, converge
back to it. This true asymptote corresponds to an ideal-gas ratio of
specific heats of 5/3 (like a monatomic gas), which indicates a fourfold
compression under strong shock conditions. This correspondence occurs at a
pressure considerably above the 1000-megabar limit intended for the
equations. As a consequence of the overshoot, a value of a of 0.5 is used
for all metals except thorium and beryllium, which require values of 0.4
and 0.55, respectively, for an acceptable representation of the data.

REGION III

In Region III, the energy produced by the shock has been insufficient
to produce a change of phase in the material, and the hydrodynamic processes
remain elastic. In a two-phase (solid, gas) model, material that undergoes
shock and then reaches normal volume ($V/V_0 = 1$, $E > 0$) isentropically
with energy less than some characteristic energy E_s, will return to zero
pressure and remain solid. This energy, E_s, is defined as the sublimation
point and is determined (at zero pressure) from thermodynamic data of
each material and is equivalent to the total heat at the boiling point. A
more reasonable value might be $E_s' = E_s + \epsilon E_v$, where ϵ is the fraction of
vaporization energy to be added to E_s to guarantee a gas-like behavior as
$p \rightarrow 0$. In some cases, it is actually advantageous to pick an ϵ somewhat
greater than zero, as will be seen in the following discussion of Region IV.

The form of the equation of state in Region III is, then, identical to
that in Region II. The differences exist only as a consequence of defining
a change of phase of the material. In numerical calculations, the situation
is controlled simply by testing for specific volume between normal and V_s
and then determining the energy. If E is greater than E_s' in this volume
increment, the material is a gas. In this case, the change of phase is
approximated as an isoenergy curve, rather than as an isentrope, with a
zero-pressure energy equal to E_s'. The error in total energy (i.e., $-PdV$)
encountered by using this approximation is very slight and is probably not

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worth the programming effort necessary to correct it. However, the decision must depend on the intended application.

REGION IV

This region represents the gas phase of the material and has an equation of state of the form

$$P = aE\rho + \left\{ \frac{bE\rho}{\dfrac{E}{E_0\eta^2} + 1} + A\mu\ e^{-\beta[(V/V_0)-1]} \right\} e^{-\alpha[(V/V_0)-1]^2} \qquad (8)$$

where α and β are constants controlling the rate of convergence to the ideal gas. The other constants and variables are defined in the same manner as in Region II. The exponential factors attenuate the bracketed function and thus force the second term in the equation to approach zero at large volumes. The remaining $aE\rho$ term is then equivalent to the ideal-gas form $(\gamma - 1)E\rho$. In most cases, the choice of a corresponds to a γ of 1.5, which is quite reasonable for real gases.

Across the change-of-phase line at V_0, it is desirable that the pressure and its first derivatives be continuous. It can easily be shown that these conditions are fulfilled for the above formulation. There is a difficulty, however, at volumes slightly greater than V_0, in that the above equation is not monotonic at low energies and can even go negative before the exponential attenuation damps the negative term. If, on the other hand, the change-of-phase energy can be properly chosen, the ill-behaved region can be excluded from the formulation. In most cases, the boiling-point energy proved adequate, and in no case was it necessary to add more than 20% of the vaporization energy to obtain an adequate behavior.

ACKNOWLEDGMENT

Appendix A

A LOW-PRESSURE EQUATION OF STATE USEFUL
FROM 0 TO 5 MEGABARS

In the Mie-Grüneisen equation of state, which is given in the form

$$P = G(V) \; E\rho + f(V) \; , \qquad (9)$$

both volume-dependent terms, $G(V)$ and $f(V)$, must be evaluated to give a quantitative thermodynamic description of the material. In addition to P, V, E data, the Grüneisen coefficient, G, can be calculated[1][2] from shock-wave measurements by use of the Dugdale-MacDonald relation, which gives G as a function only of the volume, in agreement with Grüneisen's original postulate.[10] On the other hand, the function of integration, $f(V)$, can be solved more generally from boundary conditions in the P, V, E surface.

For present purposes, this is accomplished by use of the Rankine-Hugoniot conservation equations, i.e.,

$$\rho_0 U_s = \rho_H (U_s - U_p) \; , \qquad (10)$$

$$P_0 + \rho_0 U_s^2 = P_H + \rho_H (U_s - U_p)^2 \; , \qquad (11)$$

$$E_H - E_0 = \frac{P_H + P_0}{2} (V_0 - V_H) \; , \qquad (12)$$

where U_s is the shock-wave velocity relative to the state ahead of the shock front and U_p is the particle velocity due to the shock. P, ρ, and E represent pressure, density, and energy terms, respectively, before (subscript 0) and after (subscript H) the shock. These equations specify the conservation of mass, momentum, and energy across a shock interface--the so-called jump conditions.

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For low pressures, an experimental equation of state that accurately defines the pressure to within a few per cent in terms of the particle velocity, U_p, is given by

$$P = \alpha U_p + \beta U_p^2 . \tag{13}$$

By eliminating the velocities between Eqs. (10), (11), and (13), the Hugoniot pressure can be written[1] as

$$P_H = \frac{V_0 \alpha^2 \left(1 - \frac{V}{V_0}\right)}{1 - \beta V_0 \left(1 - \frac{V}{V_0}\right)^2} . \tag{14}$$

For a zero reference state of $E_0 = P_0 = 0$ at normal density, Eq. (12) can be rewritten

$$E_H = \frac{P_H}{2} (V_0 - V_H) = \frac{P_H V_0}{2} \left(1 - \frac{V}{V_0}\right). \tag{15}$$

At any pressure on the Hugoniot curve, the equation of state must be valid and Eq. (9) becomes

$$P_H = G(V) E_H \rho + f(V) , \tag{16}$$

from which the function $f(V)$ can be evaluated by substitution of Eqs. (14) and (15) into (16). This gives

$$f(V) = \frac{V_0 \alpha^2 \psi}{(1 - \beta V_0)^2} \left(1 - \frac{G(V)}{2} V_0 \xi\right), \tag{17}$$

where $\xi = 1 - V/V_0$. The completed equation of state is

$$P = G(V) E \rho + \frac{V_0 \alpha^2 \xi}{(1 - \beta V_0)^2} \cdot \left(1 - \frac{G(V)}{2} V_0 \xi\right). \tag{18}$$

The experimental constants α and β and the Grüneisen coefficient are characteristic of each material. In recent calculations, $G(V)$ as a linear function of the volume $G = \psi + \omega V/V_0$ has proved quite adequate. Values of α, β, ψ, and ω are given in Table 1 for a few common metals.

Table 1

EQUATION OF STATE CONSTANTS

Metal	ρ_0 (g/cm^3)	α $(g/cm^2\text{-sec})$	β (g/cm^3)	ψ	ω
W	19.17	7.68×10^6	24.31	0.2	1.34
Cu	8.90	3.52×10^6	13.32	0.5	1.5
Ti	8.86	4.12×10^6	12.80	0.5	0.6
Pb	11.34	2.30×10^6	17.20	0	2.77
Ni	8.86	4.12×10^6	12.8	0.8	1.03

The equation of state is accurate to within a few per cent up to about 5 megabars. Further extrapolation exceeds the experimental limit, but the equation has been used without excessive error for peak pressures up to 10 megabars. This has recently been confirmed by comparison with the generalized equation of state presented in this report.

Appendix B

EQUATION OF STATE WITH GRAPHIC PRESENTATION
OF PRESSURE DATA

The equation of state with limits for Regions II, III, and IV is given below. The constants obtained for each metal are listed in Table 2 and some relevant material properties are listed in Table 3. These are followed by graphic representations of the computed pressures (Figs. 2 through 21). Two figures showing the Hugoniot curve and four isentropes are given for each metal. In addition, two graphs showing several isoenergy curves are given for tungsten and copper at volumes greater than V_0. On each Hugoniot curve Thomas-Fermi and shock-wave, check-point data are also shown. Tabular equation-of-state data are presented in Appendix C.

The formulation is believed to be accurate to within 5% of the Hugoniot pressure and to within about 8% of the isentrope pressures. All the check points computed and plotted to date are within these error limits. Perhaps more significant, however, is the simplicity of the equation, which has made it very useful for numerical calculations of hypervelocity impact.

EQUATION-OF-STATE FORMULATION FOR REGIONS II AND III

$$P = \left(a + \frac{b}{\dfrac{E}{E_o \eta^2} + 1} \right) \frac{E}{V} + A\mu + B\mu^2 ,$$

where

$$V/V_0 < 1 \qquad \text{for all } E > 0, \quad \text{(Region II)}$$

and

$$V/V_0 < V_s \qquad \text{for } E < E_s^i \qquad \text{(Region III)} .$$

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EQUATION-OF-STATE FORMULATION FOR REGION IV

$$P = aE\rho + \left\{ \frac{bE\rho}{\dfrac{E}{E_0\eta^2} + 1} + A\mu\ e^{-\beta[(V/V_0)-1]} \right\} e^{-\alpha[(V/V_0)-1]^2}$$

where

and

$$1 < V/V_0 < V_s \qquad \text{for } E > E_s' \ ,$$

$$V/V_0 > V_s \qquad \text{for all } E > 0 \ .$$

Table 2

EQUATION-OF-STATE CONSTANTS

Metal	a	b	A (megabar)	B (megabar)	E_0 (megabar-cm^3/g)	α	β	E_s' (megabar-cm^3/g)	V_s[a] (cm^3/g)
W	0.5	1.04	3.08	2.5	0.225	10	10	0.01135	1.11
Cu	0.5	1.5	1.39	1.1	0.325	5	5	0.0138	1.18
Fe	0.5	1.5	1.279	1.05	0.095	5	5	0.0244	1.21
Al	0.5	1.63	0.752	0.65	0.05	5	5	0.03	1.1
Be	0.55	0.62	1.1734	0.55	0.175	5	5	0.100	1.1
Ti	0.5	0.60	1.03	0.5	0.07	5	5	0.035	1.09
Ni	0.5	1.33	1.912	1.5	0.09	5	5	0.0285	1.11
Mo	0.5	1.02	2.713	1.65	0.045	5	5	0.028	1.08
Th	0.4	0.86	0.531	0.5	0.025	9	0.88	0.02	1.15

[a] Approximate values calculated from Eq. (6) with B = 0.

Table 3

MATERIAL PROPERTIES

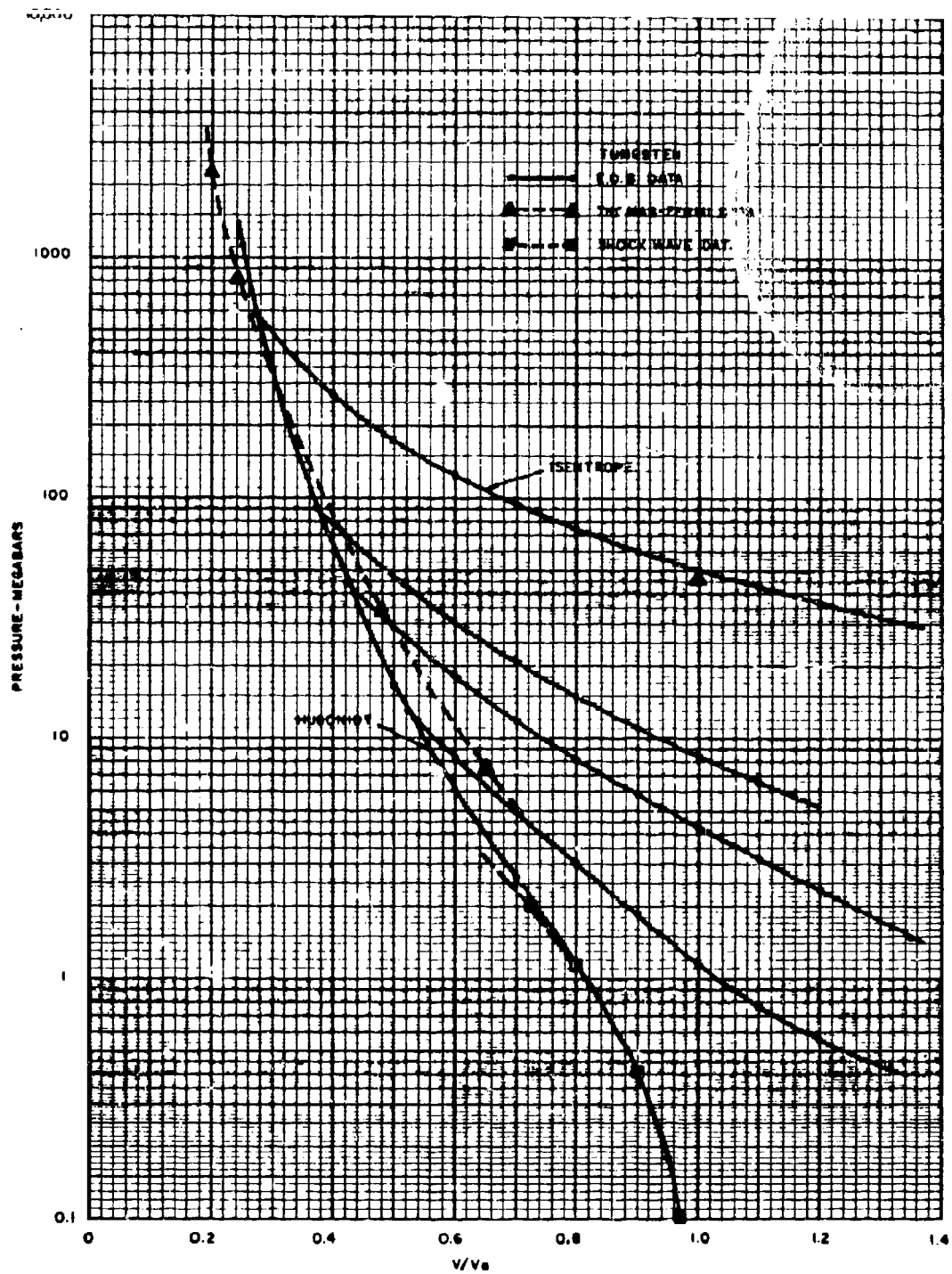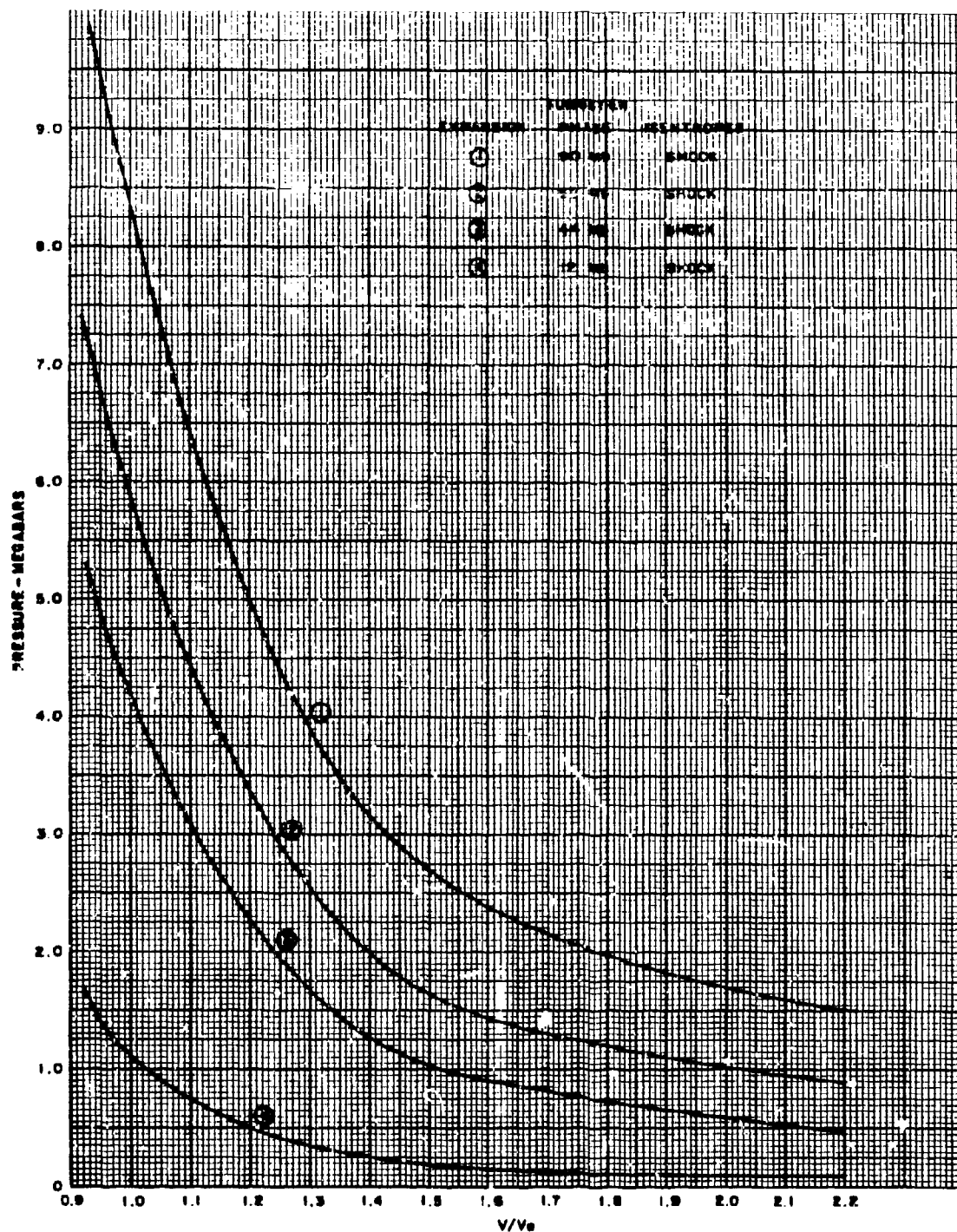| Metal	Normal Density, ρ_0 (g/cm^3)	Boiling Point, BP ($^\circ$K)	Characteristic Energy at BP, E_{BP} (megabar-cm^3/g)
W	19. 17	5800	0. 011322
Cu	8. 90	2855	0. 01380
Fe	7. 86	3160	0. 024106
Al	2. 70	2720	0. 02979
Be	1. 845	2750	0. 0895
Ti	4. 51	3550	0. 02609
Ni	8. 86	3110	0. 02014
Mo	10. 2	5100	0. 02134
Th	11. 68	4500	0. 008787

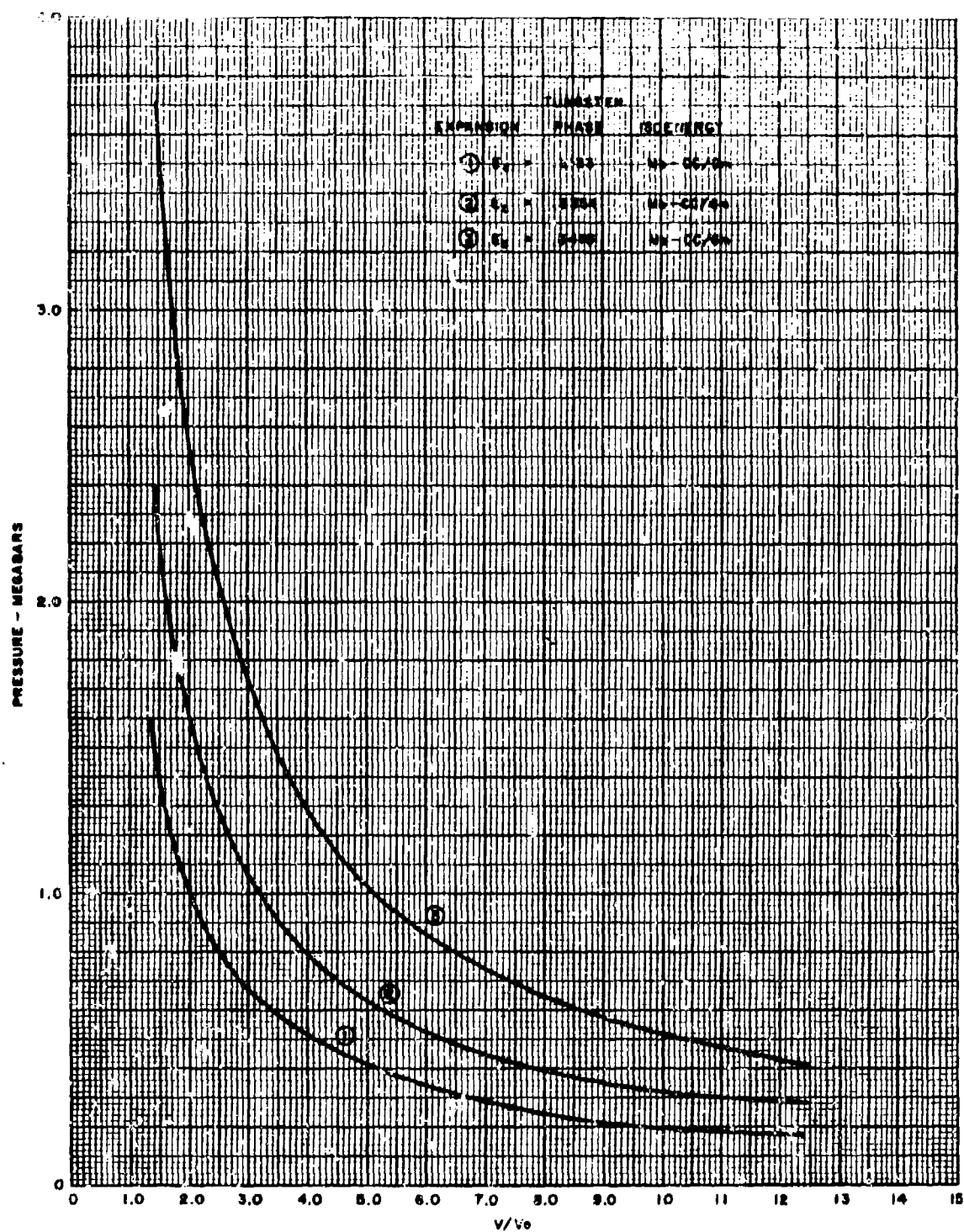Fig. 2--Tungsten equation of state

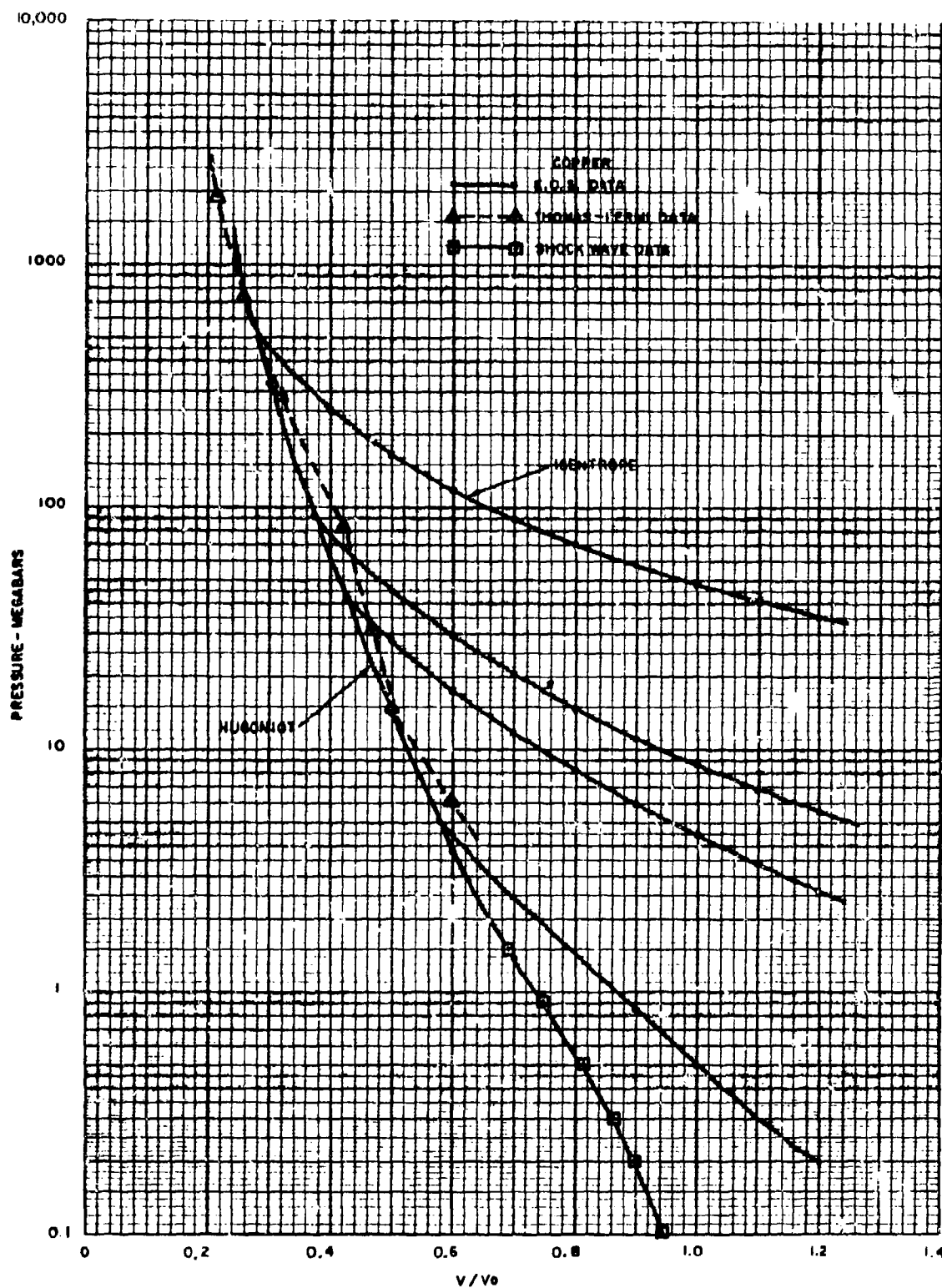Fig. 3--Tungsten isentropes

Fig. 4--Tungsten isoenergy curves

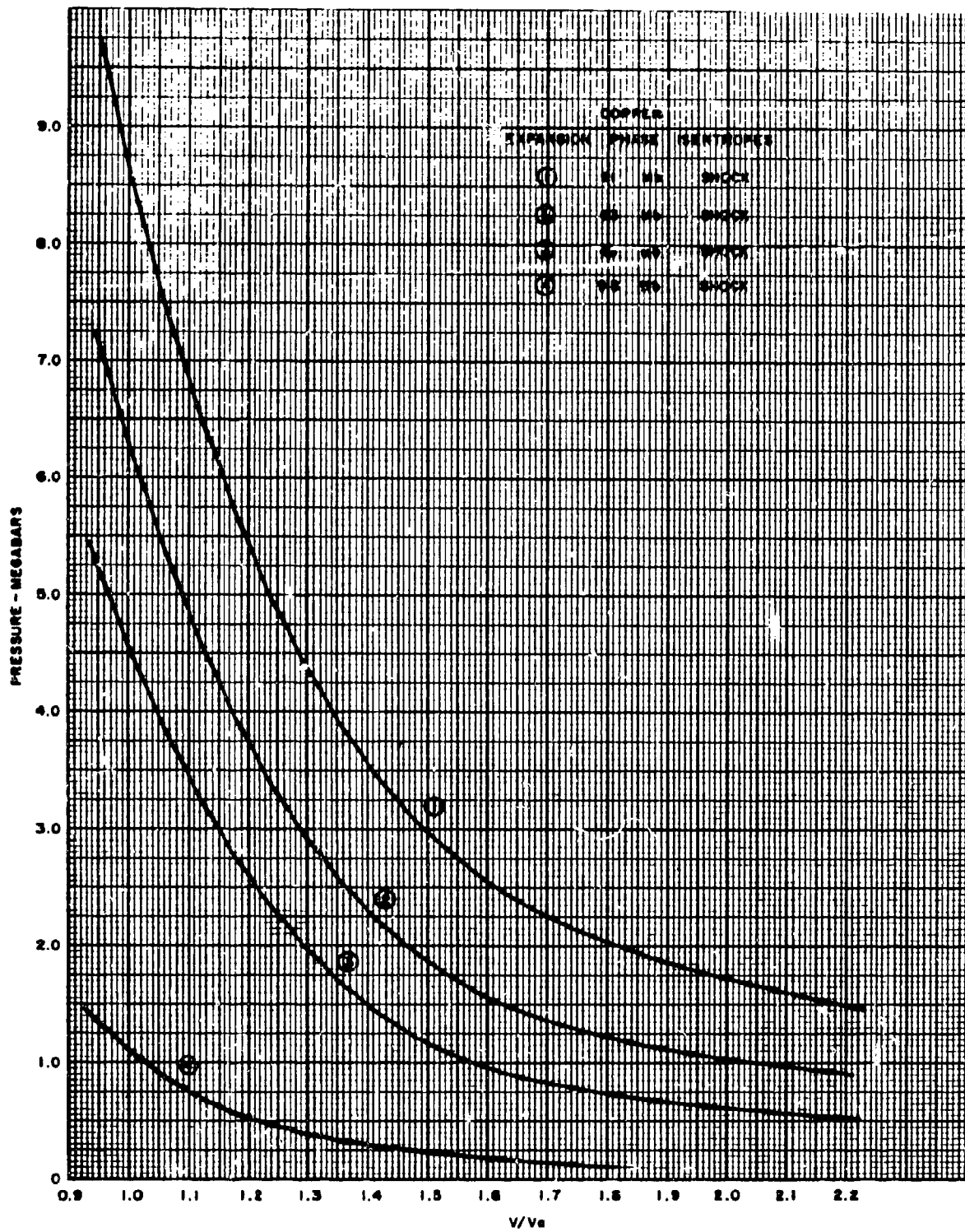Fig. 5--Copper equation of state

Fig. 6--Copper isentropes
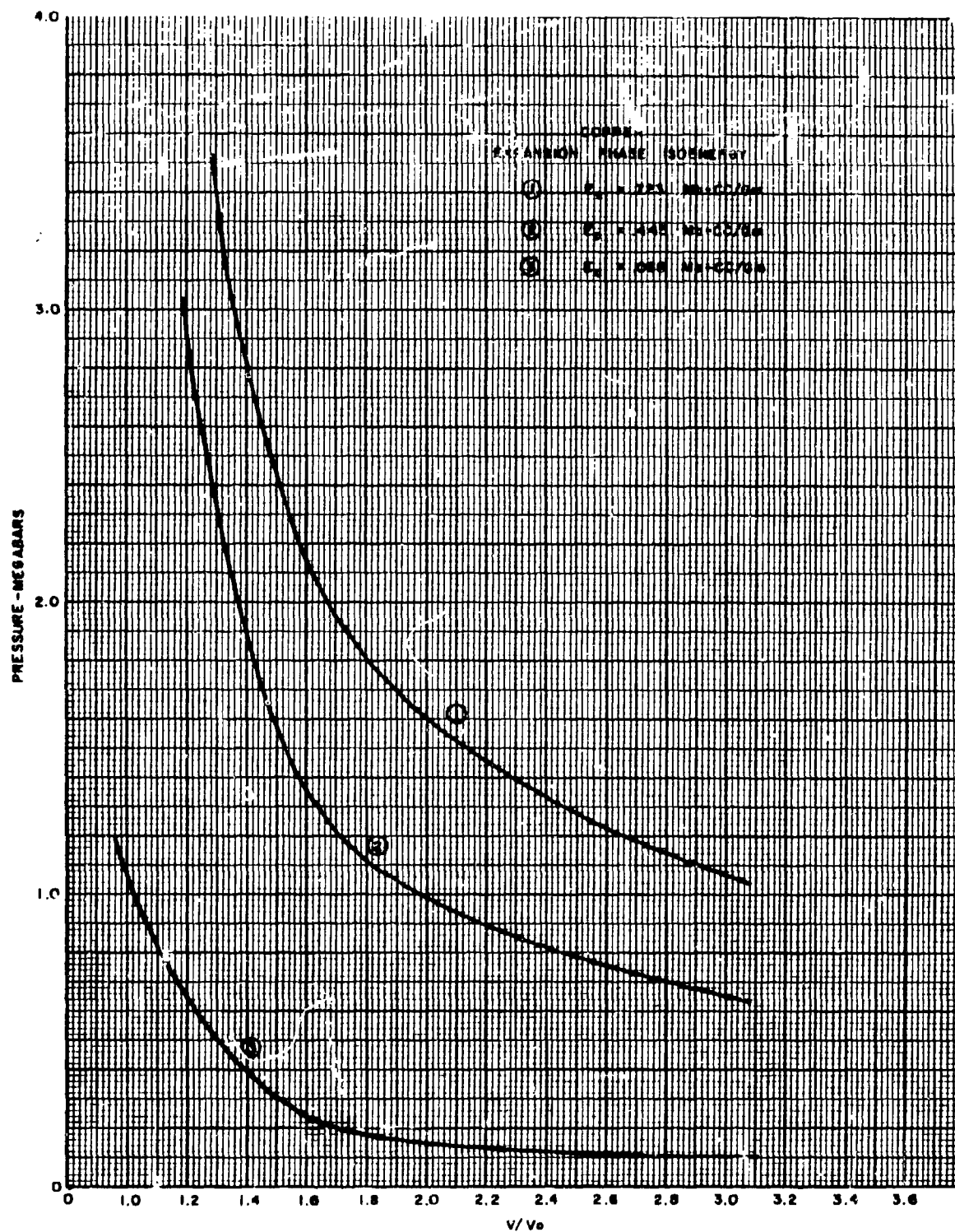
Fig. 7--Isoenergy curves
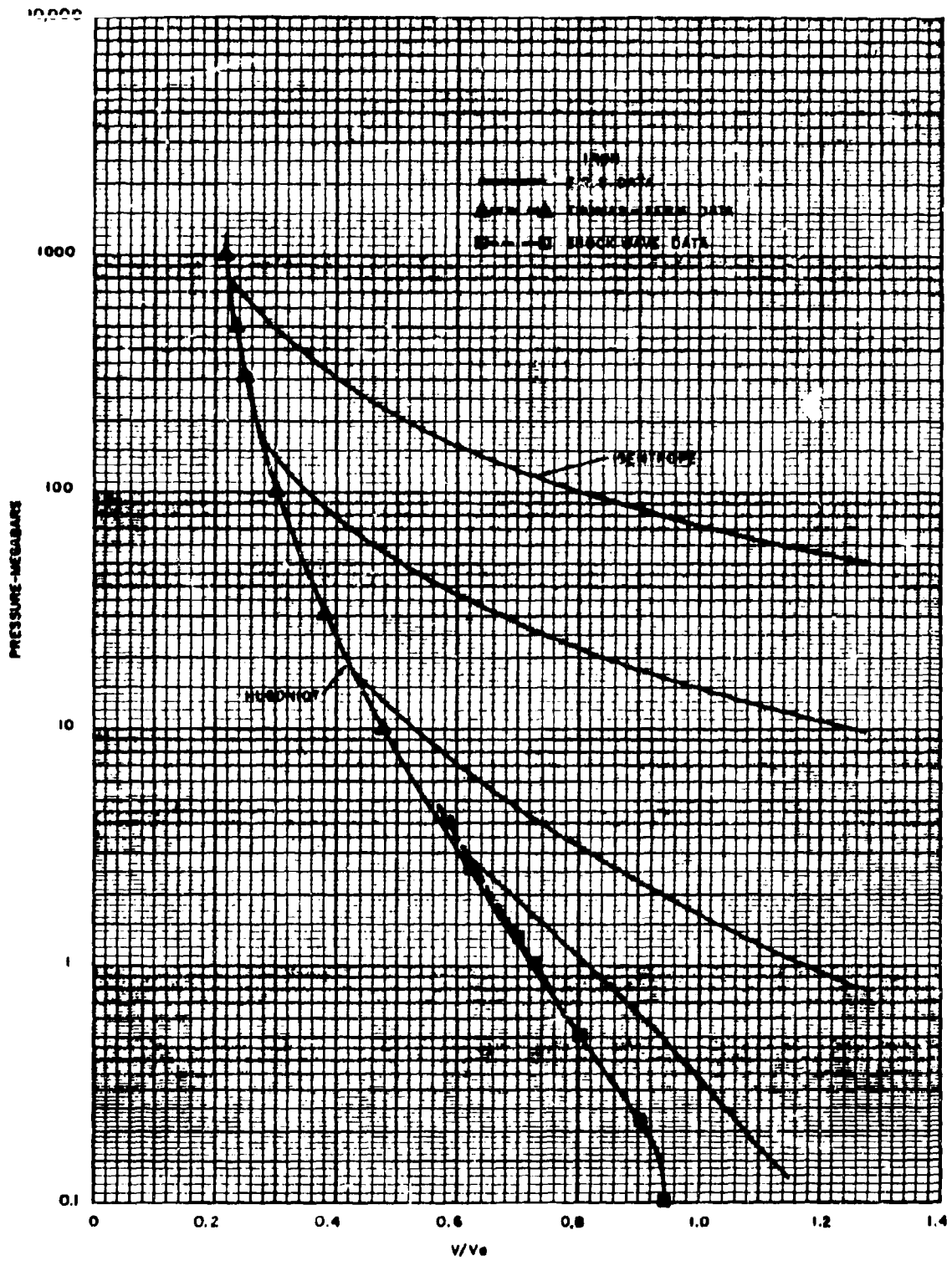
Fig. 8--Iron equation of state
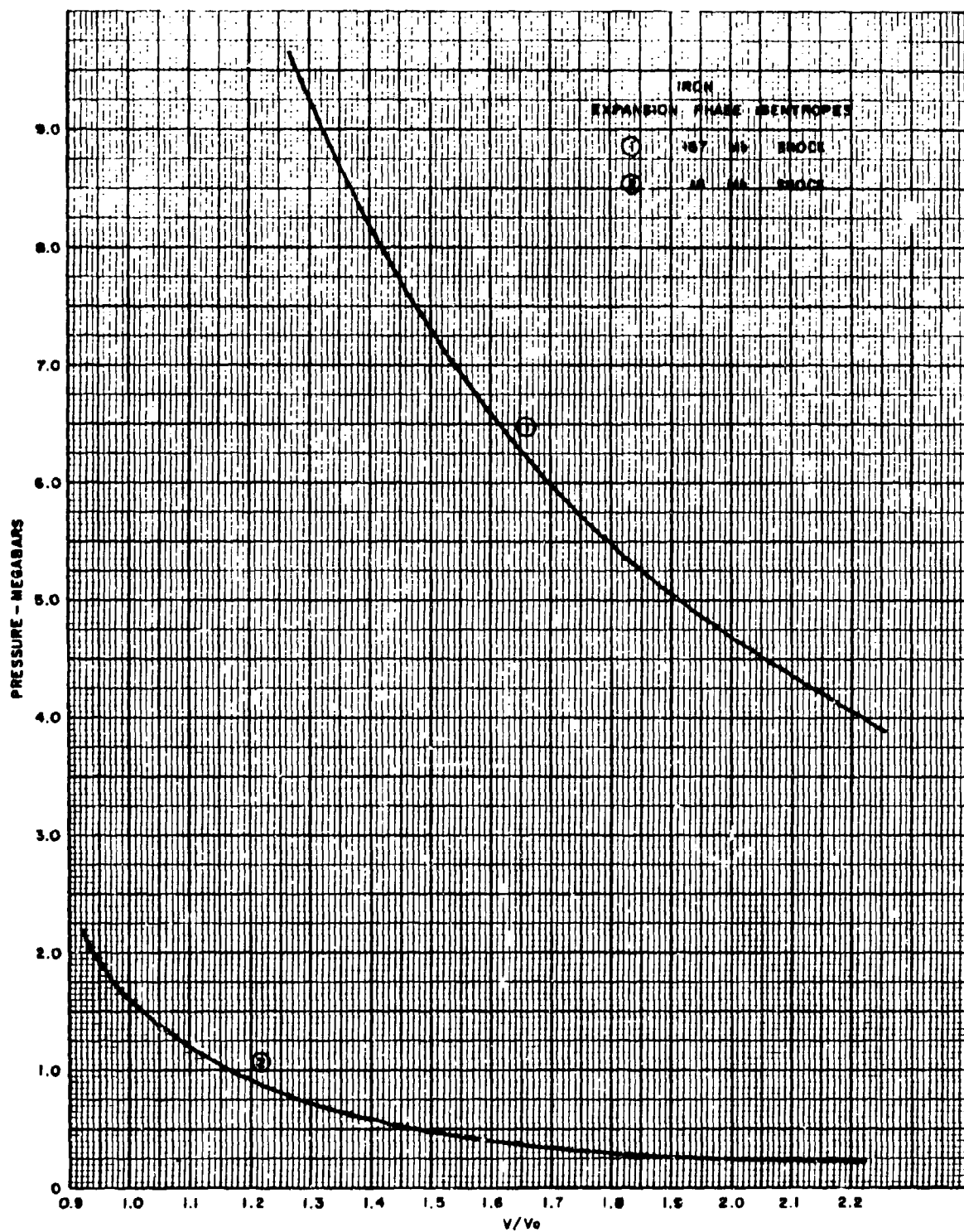
Fig. 9--Iron isentropes
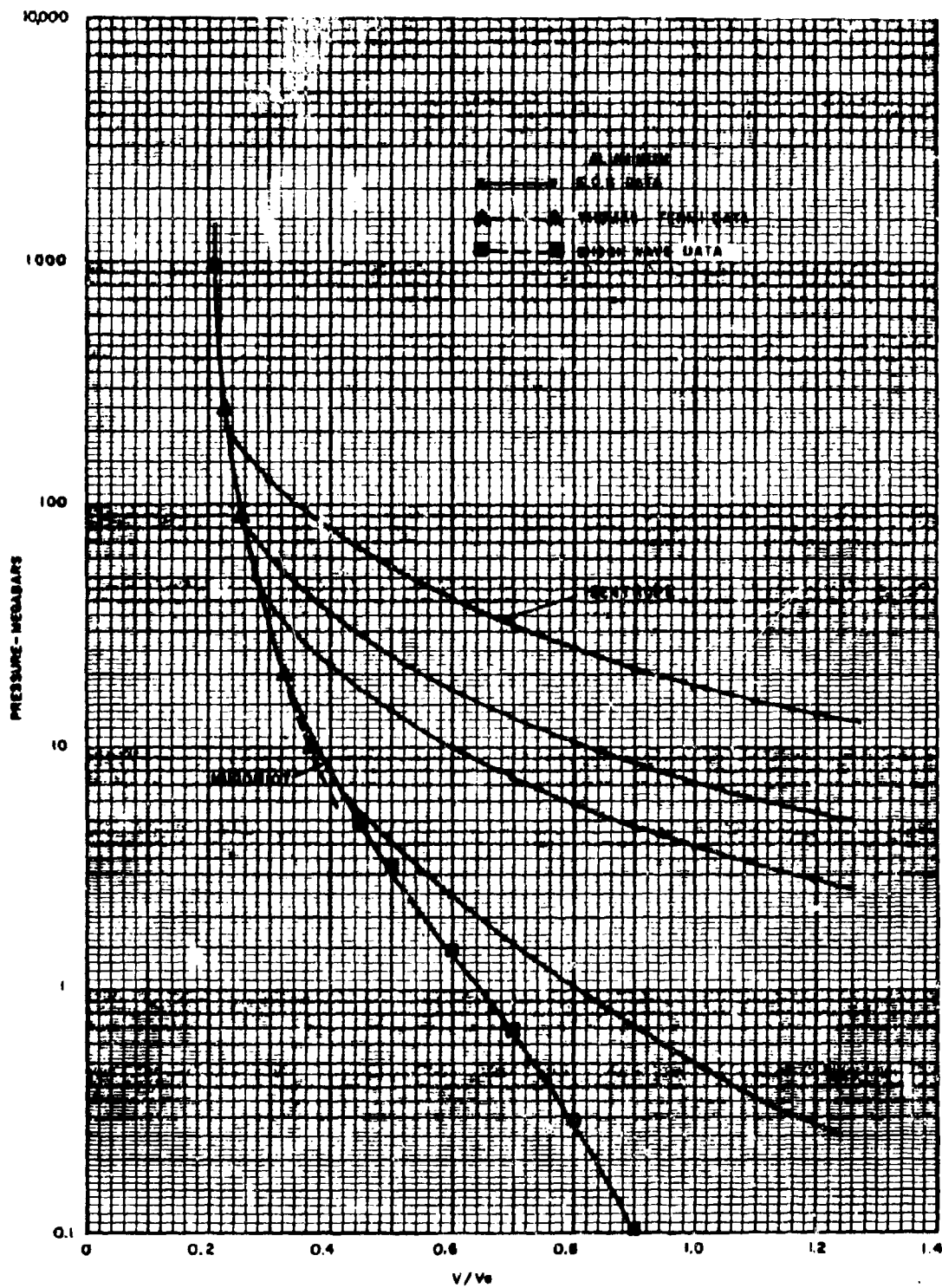
Fig. 10--Aluminum equation of state
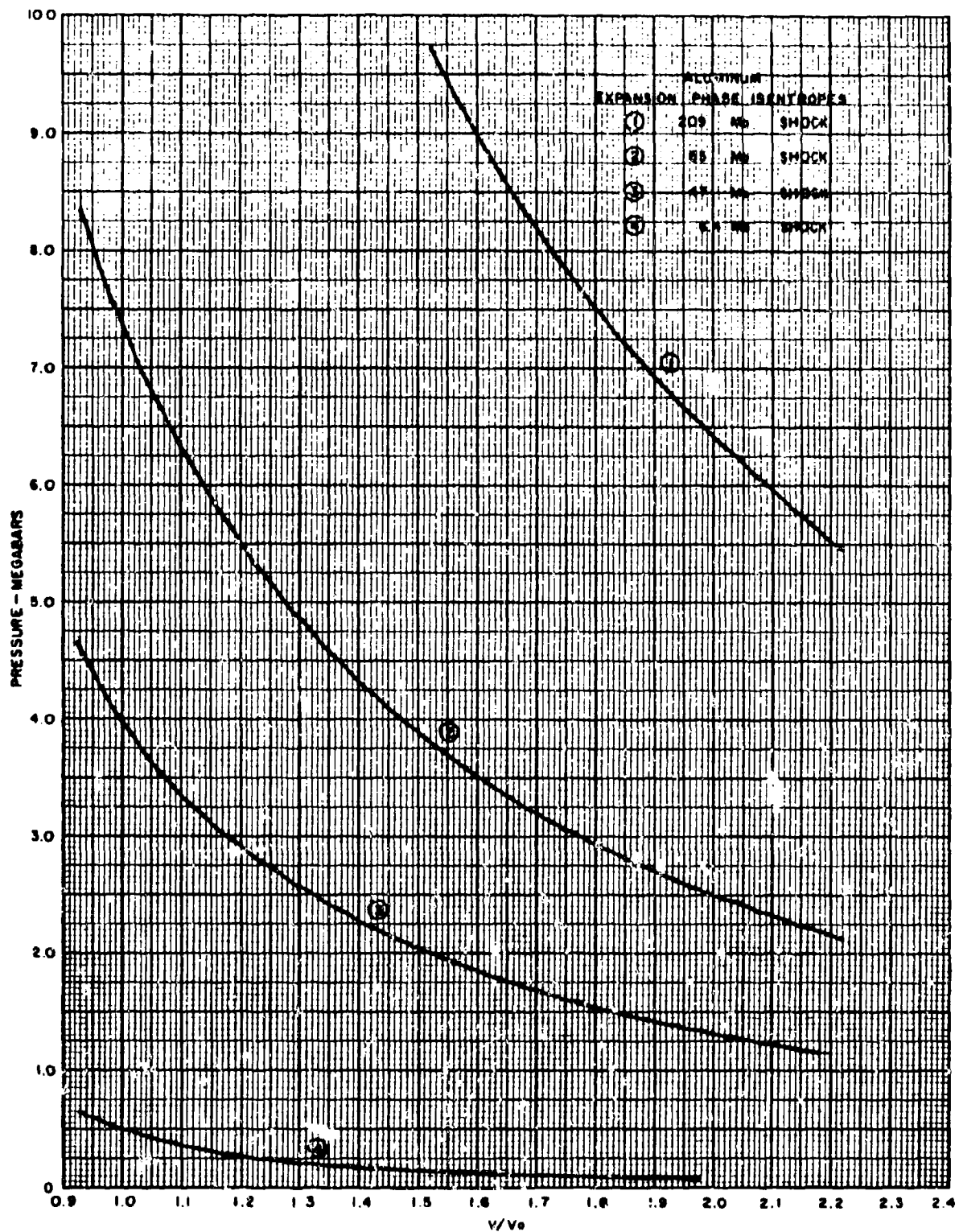
Fig. 11--Aluminum isentropes

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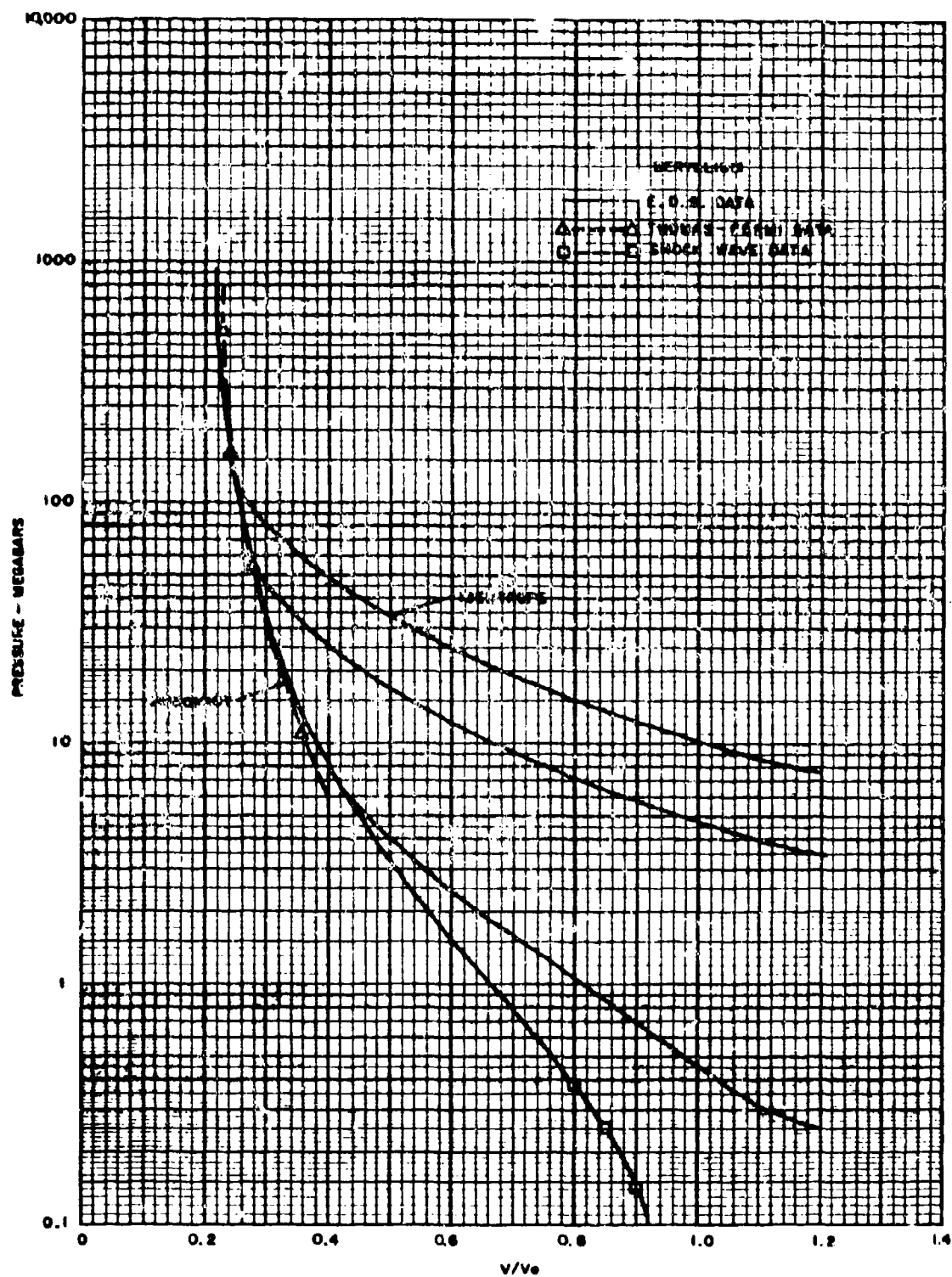
Fig. 12--Beryllium equation of state

TRI-SERVICE IMPLEMENTATION OF DOD INSTRUCTIONS

The DoD Instructions listed on the attached letter have been implemented as indicated:

DoD Instruction 5200.20, 29 March 1965 - (Army) AR 70-31, 21 July 1965
(Navy) NAVMAT Inst 4000.17, 9 June 1965
(Air Force) AFR 310.2, 12 July 1965

DoD Instruction 5100.36, 29 March 1965 - (Army) AR 70-11, 8 October 1965
(Navy) SECNAV 3900.24A, 4 August 1965
(Air Force) AFR 80-29, 18 May 1964 (under
revision)

Fig. 13--Beryllium equation of state

Fig. 14--Titanium equation of state

Fig. 15--Titanium isentropes

Fig. 16--Nickel equation of state

33
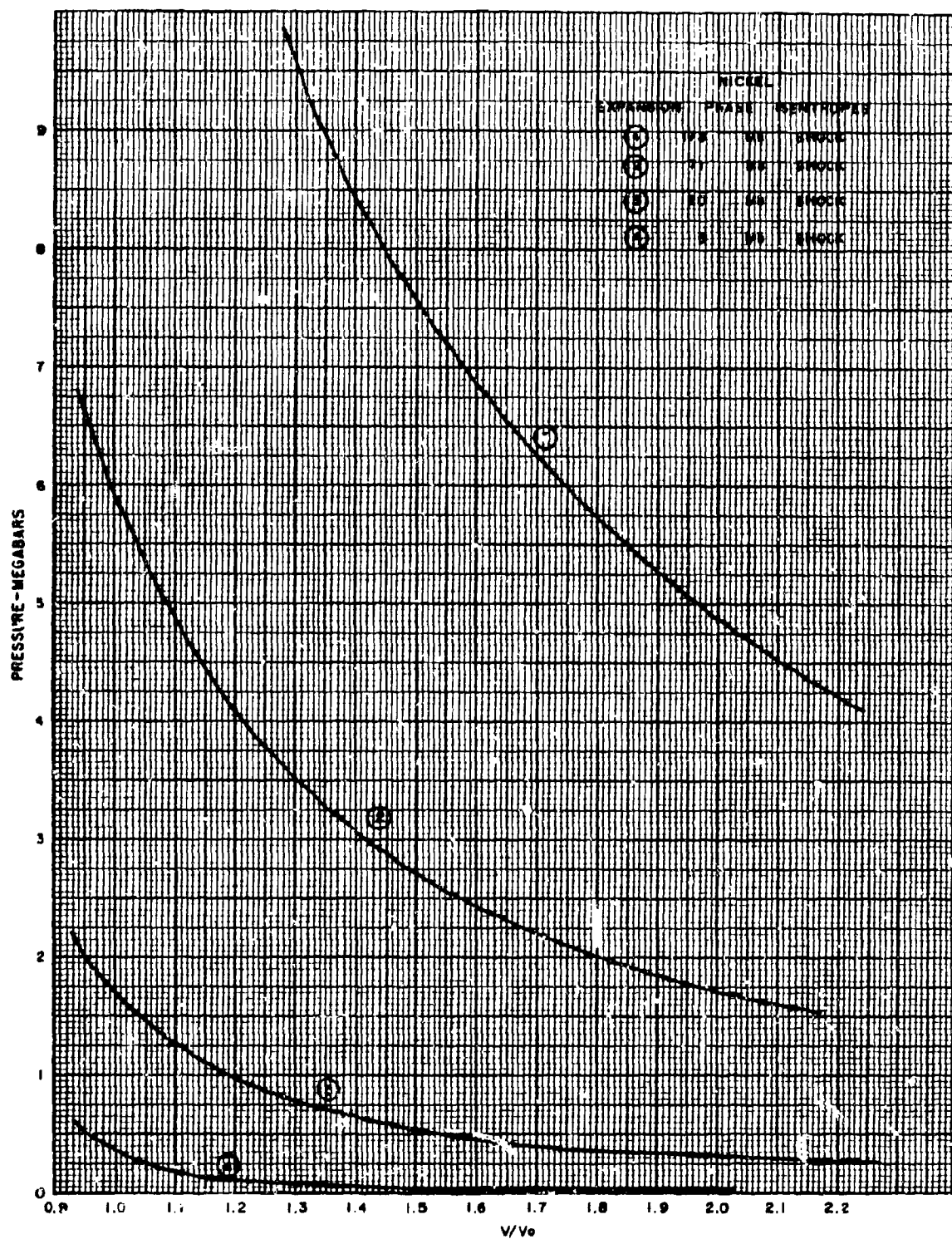
Fig. 17--Nickel isentropes
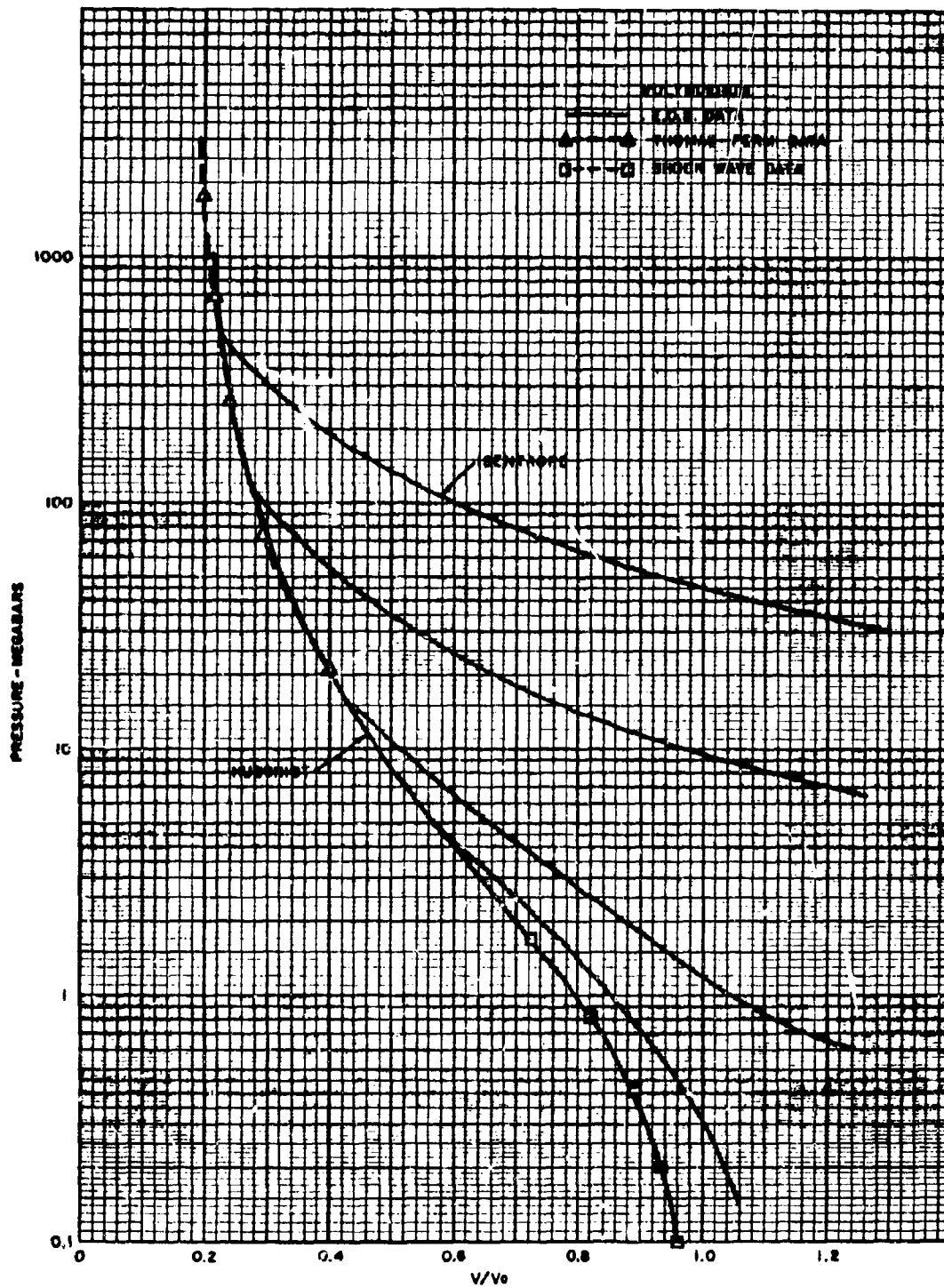
Fig. 18--Molybdenum equation of state
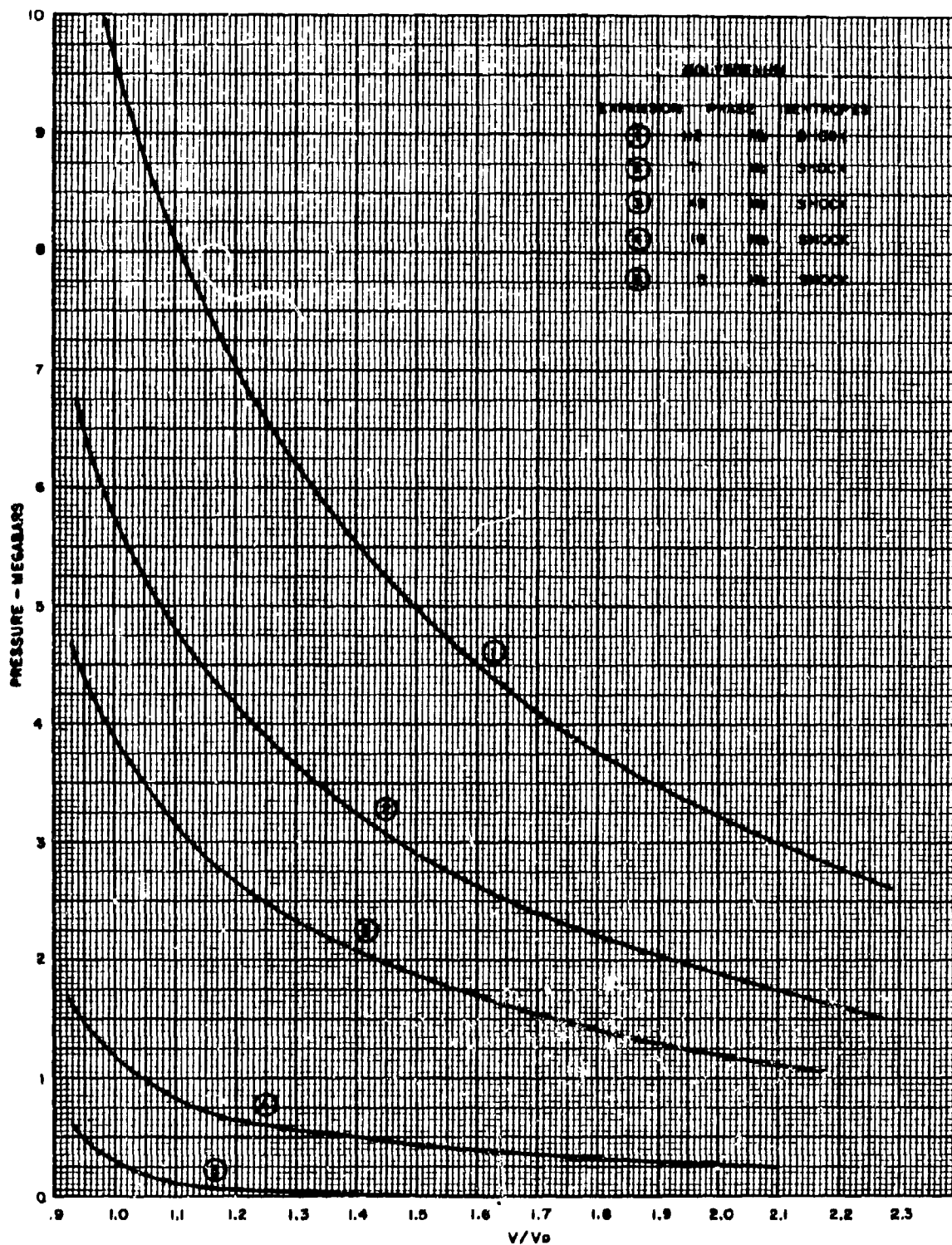
Fig. 19--Molybdenum isentropes
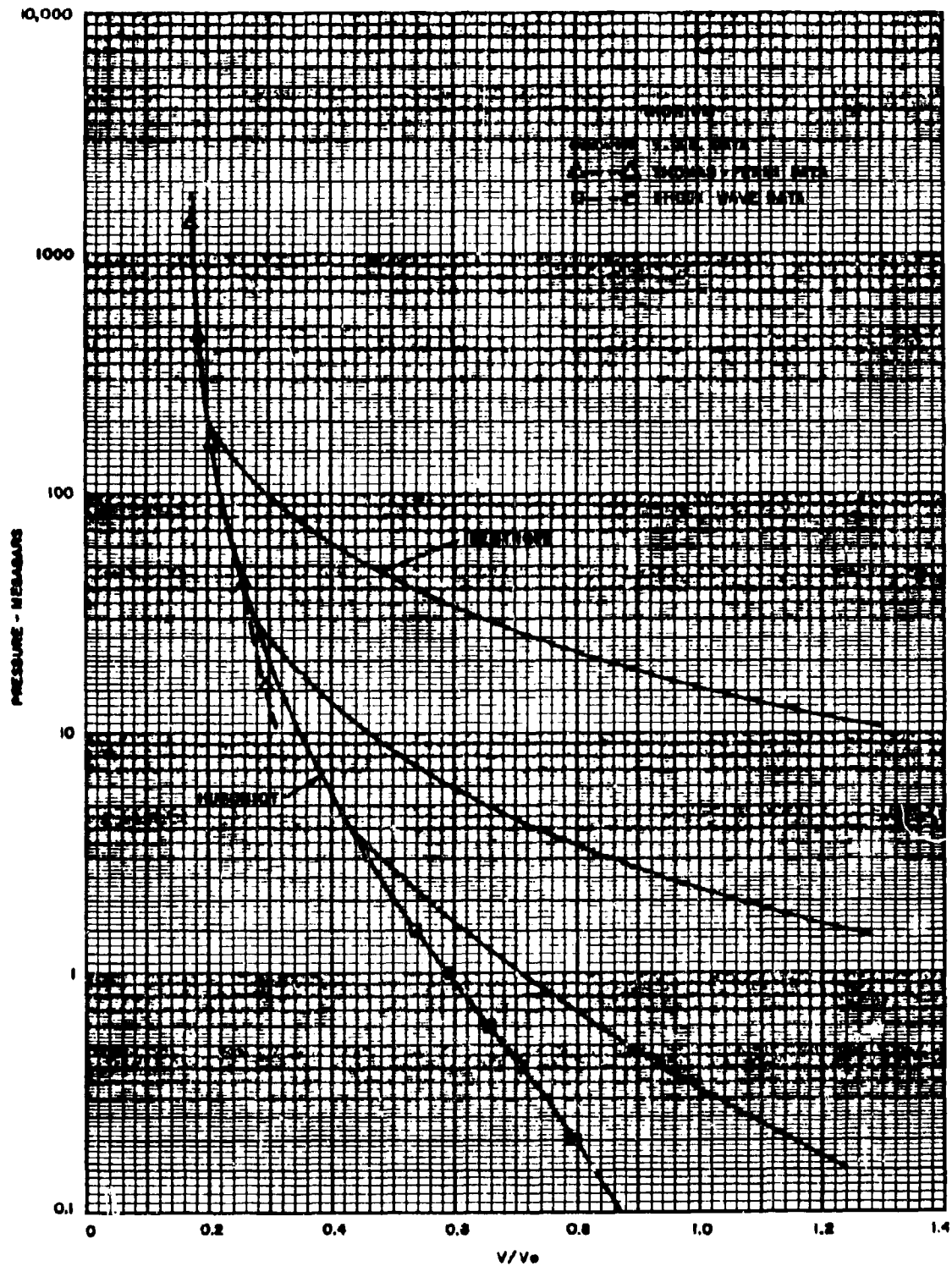
Fig. 20--Thorium equation of state
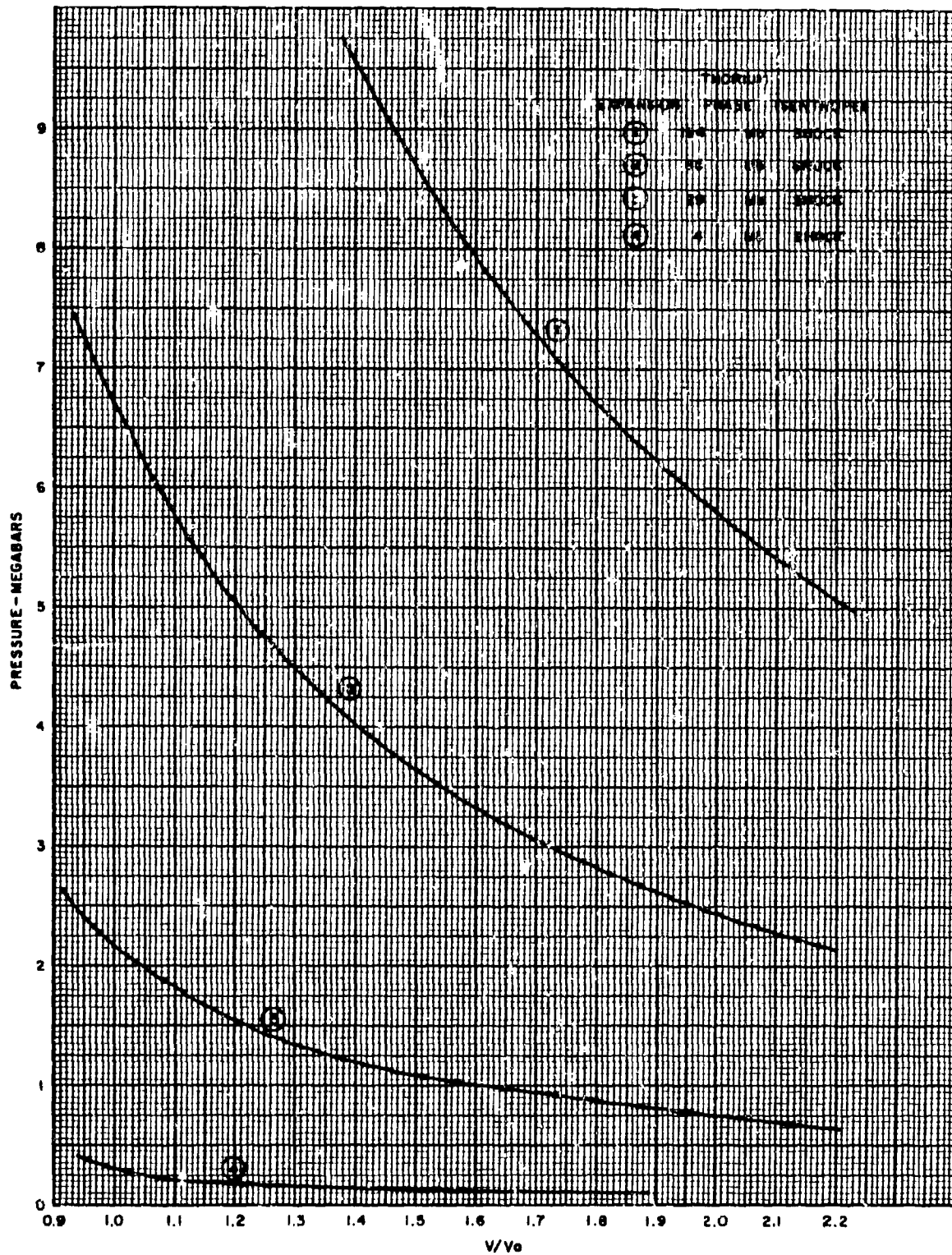
Fig. 21--Thorium isentropes
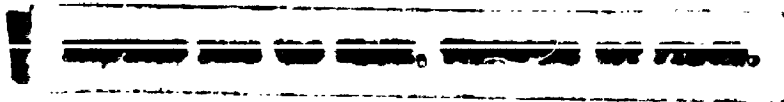
Appendix C

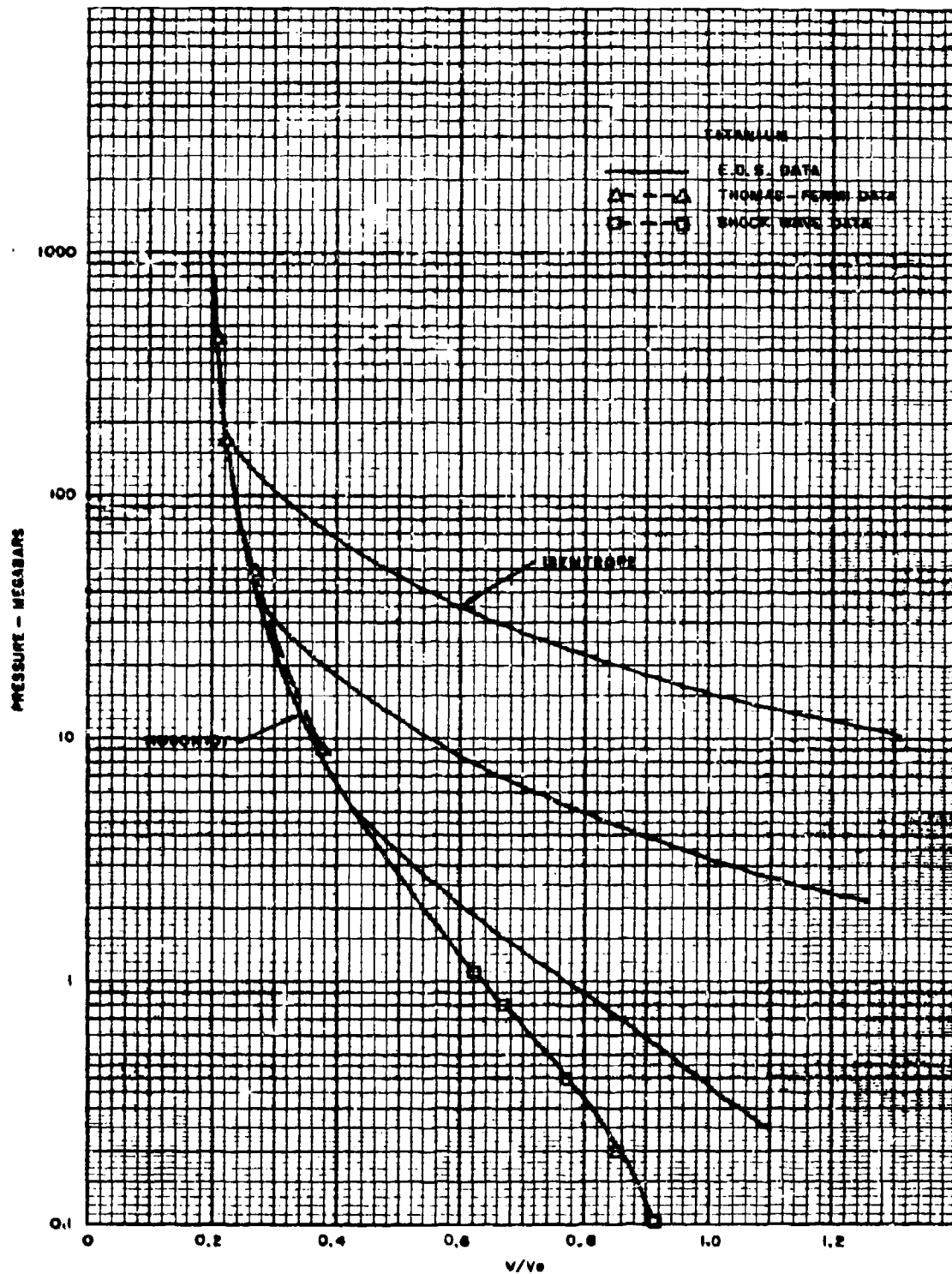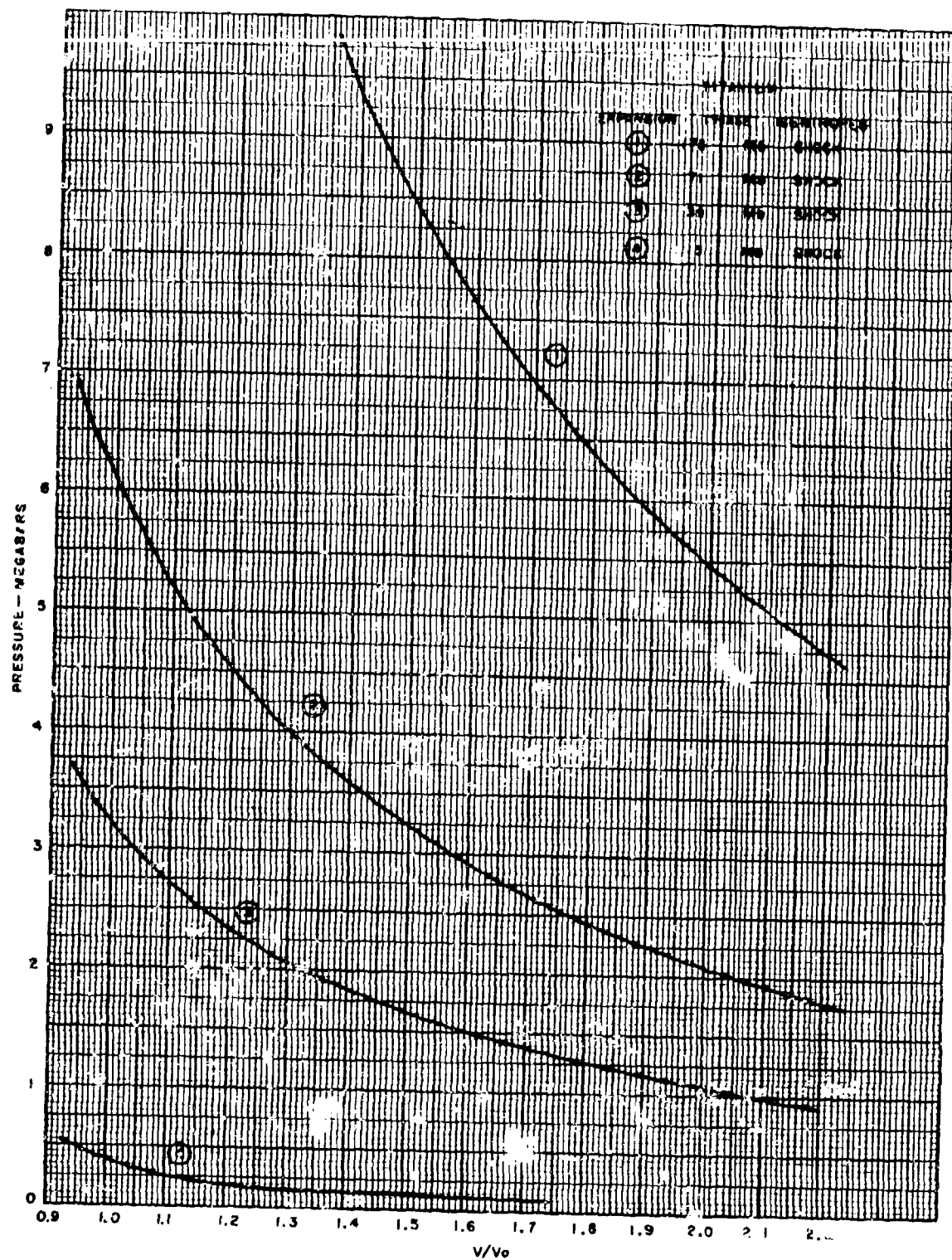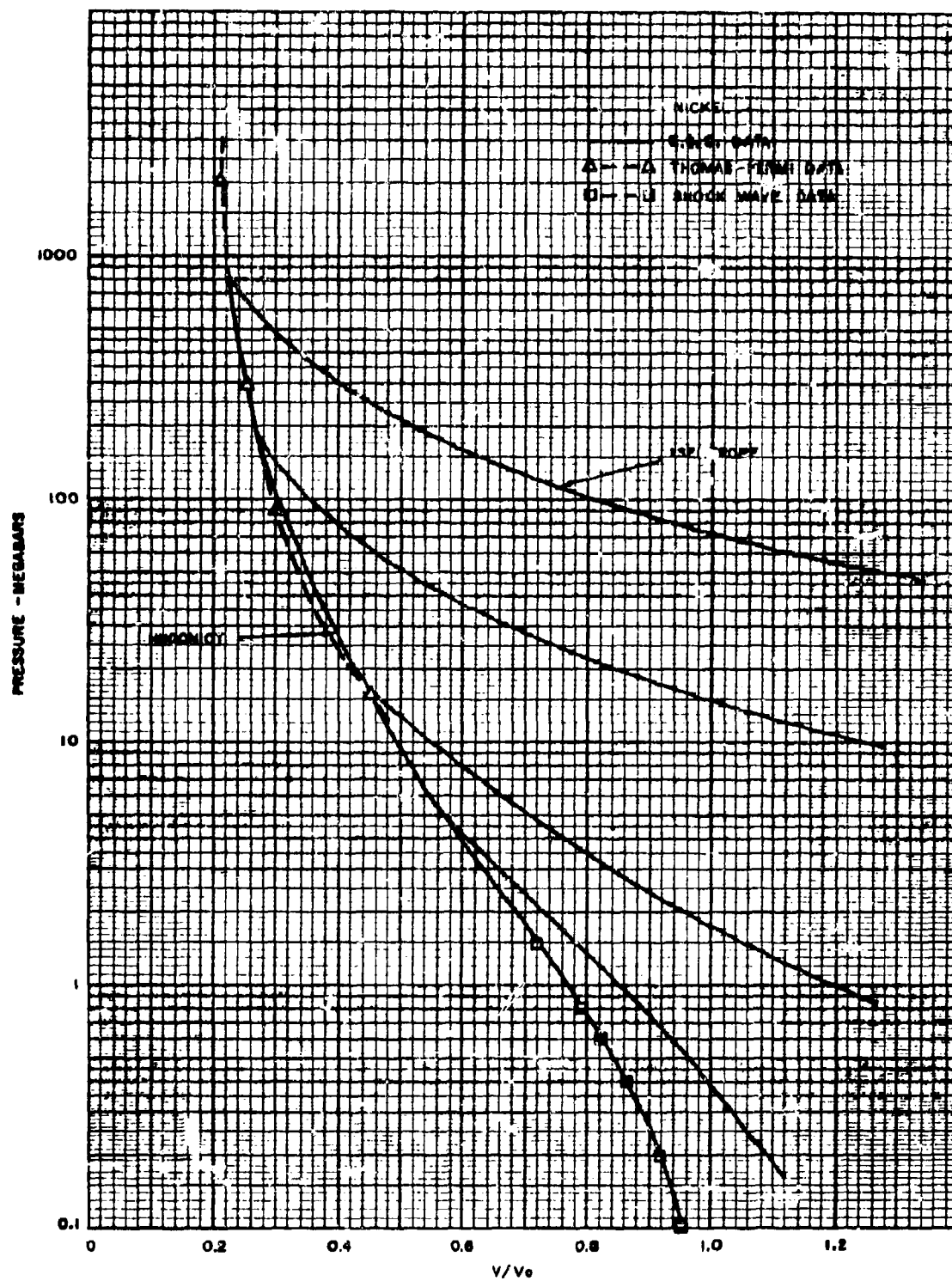TABULAR DATA FOR EQUATIONS OF STATE

TUNGSTEN

ELUATICN OF STAIE

AC = 10   WC = 10   a = .5

FG	RHOIN	AMU	BMU	????
1.0400	19.1700	3.0800	2.5000	0.2? 200?

1   HUGONIOT PRESSUKES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	1.0000	0.	0.
2	0.9750	0.082241	0.00005162
3	0.9500	0.176165	0.00022974
4	0.9250	0.283862	0.00055528
5	0.9000	0.407894	0.00106388
6	0.8750	0.551428	0.00179782
7	0.8500	0.718414	0.00281069
8	0.8250	0.913823	0.00417107
9	0.8000	1.143985	0.00594757
10	0.7750	1.417043	0.00831598
11	0.7500	1.743620	0.01136746
12	0.7250	2.137757	0.01533341
13	0.7000	2.618300	0.02048747
14	0.6750	3.210962	0.02721863
15	0.6500	3.951460	0.03607227
16	0.6250	4.890353	0.04783209
17	0.6000	6.100637	0.06364775
18	0.5750	7.689814	0.08524190
19	0.5500	9.819169	0.11524845
20	0.5250	12.734440	0.15776887
21	0.5000	16.813756	0.21927170
22	0.4750	22.640578	0.31002353
23	0.4500	31.113010	0.44632640
24	0.4250	43.614580	0.65410488
25	0.4000	62.314733	0.97519135
26	0.3750	90.766769	1.47963552
27	0.3500	135.188044	2.29192021
28	0.325	207.392063	3.65126845
29	0.3000	332.290359	6.06685537
30	0.2750	570.771545	10.79314923
31	0.2500	1112.291840	21.75844598

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TUNGSTEN

2. 1 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.9500	0.176165	0.00022974
2	0.9750	0.082551	0.00006386
3	1.0000	0.000362	0.00001227

TUNGSTEN

1. 1 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8750	0.551428	0.00179782
2	0.9000	0.411494	0.00117422
3	0.9250	0.289136	0.00072108
4	0.9500	0.181978	0.00041713
5	0.9750	0.087998	0.00024392
6	1.0000	0.005472	0.00018544

TUNGSTEN

2. 3 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8000	1.143985	0.00596757
2	0.8250	0.929681	0.00462215
3	0.8500	0.743300	0.00353706
4	0.8750	0.580844	0.00267863
5	0.9000	0.438958	0.00201797
6	0.9250	0.314812	0.00153022
7	0.9500	0.206012	0.00119388
8	0.9750	0.110520	0.00099035
9	1.0000	0.026599	0.00090344

TUNGSTEN

1. 2 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.7250	2.137757	0.01533341
2	0.7500	1.796937	0.01277892
3	0.7750	1.502545	0.01063692
4	0.8000	1.247483	0.00885179
5	0.8250	1.025885	0.00737631
6	0.8500	0.832873	0.00617021
7	0.8750	0.664372	0.00519904
8	0.9000	0.516960	0.00443316
9	0.9250	0.387751	0.00384708
10	0.9500	0.274299	0.00341874
11	0.9750	0.174526	0.00312901
12	1.0000	0.086655	0.00296127
13	1.0250	0.009167	0.00290105

TUNGSTEN

2. 5 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.6500	3.951460	0.03607227
2	0.6750	3.376909	0.03131367
3	0.7000	2.884840	0.02724725
4	0.7250	2.461675	0.02377495
5	0.7500	2.096389	0.02081460
6	0.7750	1.779972	0.01829696
7	0.8000	1.505013	0.01616348
8	0.8250	1.265379	0.01436430
9	0.8500	1.055968	0.01285692
10	0.8750	0.872514	0.01160485
11	0.9000	0.711430	0.01057673
12	0.9250	0.569689	0.00974544
13	0.9500	0.444724	0.00908756
14	0.9750	0.334350	0.00858267
15	1.0000	0.236698	0.00821305
16	1.0250	0.150167	0.00796320
17	1.0500	0.073378	0.00781956
18	1.0750	0.005142	0.00777024

TUNGSTEN

2. 6   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.6000	6.100637	0.06364775
2	0.6250	5.246573	0.05627985
3	0.6500	4.520051	0.04993708
4	0.6750	3.898905	0.04446872
5	0.7000	3.365394	0.03974974
6	0.7250	2.905205	0.03567588
7	0.7500	2.506707	0.03215961
8	0.7750	2.160384	0.02912712
9	0.8000	1.858398	0.02651579
10	0.8250	1.594260	0.02427230
11	0.8500	1.362564	0.02235104
12	0.8750	1.158782	0.02071282
13	0.9000	0.979108	0.01932387
14	0.9250	0.820319	0.01815496
15	0.9500	0.679686	0.01718073
16	0.9750	0.554880	0.01637911
17	1.0000	0.443908	0.01573081

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU = 0.

18	1.0000	0.443908	0.01573081
19	1.0500	0.304812	0.01483676
20	1.1000	0.245377	0.01413419
21	1.1500	0.214613	0.01352601
22	1.2000	0.190596	0.01298113
23	1.2500	0.166956	0.01249867
24	1.3000	0.143748	0.01208108
25	1.3500	0.122625	0.01172563
26	1.4000	0.104836	0.01142444
27	1.4500	0.090768	0.01116710
28	1.5000	0.080122	0.01094332
29	1.6000	0.066426	0.01056542
30	1.7000	0.058530	0.01024229
31	1.8000	0.053156	0.00995237
32	1.9000	0.048895	0.00968696
33	2.0000	0.045254	0.00944193
34	2.1000	0.042059	0.00921462
35	2.2000	0.039224	0.00900296
36	2.3000	0.036695	0.00880525
37	2.4000	0.034426	0.00862000
38	2.5000	0.032382	0.00844597
39	2.6000	0.030532	0.00828207
40	2.7000	0.028852	0.00812735
41	2.8000	0.027321	0.00798099
42	2.9000	0.025920	0.00784225
43	3.0000	0.024635	0.00771051
44	3.1000	0.023453	0.0075859
45	3.2000	0.022362	0.00746578
46	3.3000	0.021354	0.00735184
47	3.4000	0.020419	0.00724296
48	3.5000	0.019550	0.00713878
49	3.6000	0.018741	0.00703897
50	3.7000	0.017987	0.00694323

TUNGSTEN

EXPANSION PHASE – ISOENERGY ABOVE ESLIM

51	1.0000	0.443908	0.01573081
52	1.1000	0.281726	0.01573061
53	1.2000	0.238246	0.01573081
54	1.3000	0.189317	0.01573081
55	1.4000	0.144223	0.01573081
56	1.5000	0.114782	0.01573081
57	1.6000	0.098702	0.01573081
58	1.7000	0.089828	0.01573081
59	1.8000	0.084002	0.01573081
60	1.9000	0.079398	0.01573081
61	2.0000	0.075396	0.01573081
62	2.1000	0.071801	0.01573081
63	2.2000	0.068536	0.01573081
64	2.3000	0.065556	0.01573081
65	2.4000	0.062825	0.01573081
66	2.5000	0.060312	0.01573081
67	2.6000	0.057992	0.01573081
68	2.7000	0.055844	0.01573081
69	2.8000	0.053850	0.01573081
70	2.9000	0.051993	0.01573081
71	3.0000	0.050240	0.01573081

TUNGSTEN

1. 3   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.5750	7.689814	0.08524180
2	0.6000	6.627786	0.07594578
3	0.6250	5.727742	0.06792190
4	0.6500	4.960719	0.06097931
5	0.6750	4.303711	0.05496072
6	0.7000	3.738297	0.04973555
7	0.7250	3.249599	0.04519475
8	0.7500	2.825521	0.04124671
9	0.7750	2.456159	0.03781405
10	0.8000	2.133348	0.03483108
11	0.8250	1.850323	0.03224178
12	0.8500	1.601445	0.02999818
13	0.8750	1.381987	0.02805900
14	0.9000	1.187971	0.02638861
15	0.9250	1.016030	0.02495616
16	0.9500	0.863305	0.02373482
17	0.9750	0.727357	0.02270122
19	1.0000	0.606097	0.02183490

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
19	1.0000	0.606097	0.02183490
20	1.0500	0.446404	0.02034304
21	1.1000	0.365926	0.01948981
22	1.1500	0.315280	0.01858580
23	1.2000	0.273500	0.01779596
24	1.2500	0.234738	0.01711316
25	1.3000	0.199204	0.01653252
26	1.3500	0.168424	0.01604377
27	1.4000	0.143328	0.01563210
28	1.4500	0.123881	0.01528124
29	1.5000	0.109341	0.01497622
30	1.6000	0.090780	0.01446092
31	1.7000	0.080073	0.01401925
32	1.8000	0.072749	0.01362257
33	1.9000	0.066925	0.01325932
34	2.0000	0.061943	0.01292393
35	2.1000	0.057569	0.01261279
36	2.2000	0.053689	0.01232308
37	2.3000	0.050227	0.01205245
38	2.4000	0.047122	0.01179890
39	2.5000	0.044324	0.01156069
40	2.6000	0.041792	0.01133634
41	2.7000	0.039492	0.01112456
42	2.8000	0.037396	0.01092422
43	2.9000	0.035479	0.01073433
44	3.0000	0.033720	0.01055399
45	3.1000	0.032102	0.01038246
46	3.2000	0.030609	0.01021902
47	3.3000	0.029229	0.01006306
48	3.4000	0.027949	0.00991403
49	3.5000	0.026760	0.00977142
50	3.6000	0.025653	0.00963480

TUNGSTEN

EXPANSION PHASE — ISOENERGY ABOVE ESLIM

51	1.0000	0.606097	0.02183490
52	1.1000	0.417512	0.02183490
53	1.2000	0.341192	0.02183490
54	1.3000	0.263565	0.02183490
55	1.4000	0.198982	0.02183490
56	1.5000	0.158510	0.02183490
57	1.6000	0.136681	0.02183490
58	1.7000	0.124591	0.02183490
59	1.8000	0.116576	0.02183490
60	1.9000	0.110203	0.02183490
61	2.0000	0.104651	0.02183490
62	2.1000	0.099662	0.02183490
63	2.2000	0.095131	0.02183490
64	2.3000	0.090995	0.02183490
65	2.4000	0.087203	0.02183490
66	2.5000	0.083715	0.02183490
67	2.6000	0.080495	0.02183490
68	2.7000	0.077514	0.02183490
69	2.8000	0.074746	0.02183490
70	2.9000	0.072168	0.02183490
71	3.0000	0.069762	0.02183490

1. 4   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.4250	43.614580	0.65410488
2	0.4500	37.598271	0.60145042
3	0.4750	32.655945	0.55587509
4	0.5000	28.554115	0.51614769
5	0.5250	25.118348	0.48129798
6	0.5500	22.216413	0.45055237
7	0.5750	19.746739	0.42328730
8	0.6000	17.630359	0.39899535
9	0.6250	15.805208	0.37725984
10	0.6500	14.222012	0.35773585
11	0.6750	12.841288	0.34013572
12	0.7000	11.631132	0.32421783
13	0.7250	10.565555	0.30977800
14	0.7500	9.623237	0.29664261
15	0.7750	8.786564	0.28466322
16	0.8000	8.040894	0.27371225
17	0.8250	7.373982	0.26367955
18	0.8500	6.775531	0.25446957
19	0.8750	6.236838	0.24599905
20	0.9000	5.750507	0.23819519
21	0.9250	5.310227	0.23099405
22	0.9500	4.910591	0.22433933
23	0.9750	4.546942	0.21818122
24	1.0000	4.215257	0.21247555

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
25	1.0000	4.215257	0.21247555
26	1.0500	3.641212	0.20229216
27	1.1000	3.146736	0.19340187
28	1.1500	2.705637	0.18572829
29	1.2000	2.313871	0.17915191
30	1.2500	1.975523	0.17354311
31	1.3000	1.693901	0.16875634
32	1.3500	1.467935	0.16464038
33	1.4000	1.292080	0.16105254
34	1.4500	1.157922	0.15786952
35	1.5000	1.056150	0.15499268
36	1.6000	0.916905	0.14992077
37	1.7000	0.824302	0.14541481
38	1.8000	0.753369	0.14131704
39	1.9000	0.694050	0.13755193
40	2.0000	0.642563	0.13407308
41	2.1000	0.597218	0.13084539
42	2.2000	0.556976	0.12783998
43	2.3000	0.521059	0.12503245
44	2.4000	0.488843	0.12240204
45	2.5000	0.459815	0.11993086
46	2.6000	0.433550	0.11760350
47	2.7000	0.409693	0.11540651
48	2.8000	0.387947	0.11332817
49	2.9000	0.368058	0.11135817
50	3.0000	0.349812	0.10948744

TUNGSTEN

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	4.215257	0.21247555
52	1.1000	3.384498	0.21247555
53	1.2000	2.653306	0.21247555
54	1.3000	2.062556	0.21247555
55	1.4000	1.665726	0.21247555
56	1.5000	1.431337	0.21247555
57	1.6000	1.293951	0.21247555
58	1.7000	1.202954	0.21247555
59	1.8000	1.132395	0.21247555
60	1.9000	1.072037	0.21247555
61	2.0000	1.018309	0.21247555
62	2.1000	0.969801	0.21247555
63	2.2000	0.925718	0.21247555
64	2.3000	0.885469	0.21247555
65	2.4000	0.848574	0.21247555
66	2.5000	0.814631	0.21247555
67	2.6000	0.783299	0.21247555
68	2.7000	0.754288	0.21247555
69	2.8000	0.727349	0.21247555
70	2.9000	0.702268	0.21247555
71	3.0000	0.678859	0.21247555

TUNGSTEN

1. 5   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2750	570.771545	10.79314923
2	0.3000	477.262550	10.11719143
3	0.3250	405.570992	9.54672241
4	0.3500	349.393299	9.05817556
5	0.3750	304.541531	8.63452446
6	0.4000	268.148048	8.26316988
7	0.4250	238.197260	7.93459272
8	0.4500	213.239767	7.64146864
9	0.4750	192.212137	7.37807053
10	0.5000	174.320061	7.13985562
11	0.5250	158.960667	6.92317396
12	0.5500	145.669783	6.72505897
13	0.5750	134.085337	6.54307401
14	0.6000	123.921545	6.37519878
15	0.6250	114.950390	6.21974349
16	0.6500	106.988149	6.07528353
17	0.6750	99.885429	5.94060916
18	0.7000	93.519733	5.81468600
19	0.7250	87.789838	5.69662422
20	0.7500	82.611491	5.58565384
21	0.7750	77.914101	5.48110509
22	0.8000	73.638145	5.38239229
23	0.8250	69.733148	5.28900105
24	0.8500	66.156064	5.20047760
25	0.8750	62.870002	5.11641985
26	0.9000	59.843188	5.03647035
27	0.9250	57.048132	4.96031004
28	0.9500	54.460949	4.88765311
29	0.9750	52.060800	4.81824285
30	1.0000	49.829442	4.75184792

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

31	1.0000	49.829442	4.75184792
32	1.0500	45.774699	4.62742585
33	1.1000	42.159921	4.51295996
34	1.1500	38.930805	4.40739965
35	1.2000	36.057096	4.30978853
36	1.2500	33.514774	4.21923143
37	1.3000	31.276743	4.13489544
38	1.3500	29.310456	4.05602515
39	1.4000	27.579730	3.98195648
40	1.4500	26.048122	3.91212237
41	1.5000	24.682021	3.84604901
42	1.6000	22.337837	3.72393221
43	1.7000	20.376935	3.61288372
44	1.8000	18.698579	3.51123506
45	1.9000	17.241633	3.41770822
46	2.0000	15.965149	3.33127263
47	2.1000	14.838840	3.25107533
48	2.2000	13.839001	3.17640075
49	2.3000	12.946598	3.10664320
50	2.4000	12.146136	3.04128605

TUNGSTEN

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	49.829442	4.75184792
52	1.1000	44.247343	4.75184792
53	1.2000	39.593528	4.75184792
54	1.3000	35.828852	4.75184792
55	1.4000	32.852200	4.75184792
56	1.5000	30.470592	4.75184792
57	1.6000	28.495841	4.75104792
58	1.7000	26.798717	4.75184792
59	1.8000	25.304849	4.75184792
60	1.9000	23.972018	4.75184792
61	2.0000	22.773257	4.75184792
62	2.1000	21.688794	4.75184792
63	2.2000	20.702938	4.75184T92
64	2.3000	19.802810	4.75184792
65	2.4000	18.977693	4.7518479?
66	2.5000	18.218585	4.75184792
67	2.6000	17.517870	4.75184792
68	2.7000	16.869060	4.75184792
69	2.8000	16.266594	4.75184792
70	2.9000	15.705677	4.75184792
71	3.0000	15.182154	4.75184792

COPPER

AC = 5   WC = 5   a = .5

EG	RHOIN	AMU	BMU	FSUBO
1.5000	8.9000	1.3900	1.1000	0.3250000

3   HUGONIOT PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	1.0000	0.	0.
2	0.9750	0.037320	0.00005241
3	0.9500	0.080436	0.00022594
4	0.9250	0.130504	0.00054988
5	0.9000	0.188981	0.00106169
6	0.8750	0.257720	0.00180983
7	0.8500	0.339110	0.00285766
8	0.8250	0.436267	0.00428914
9	0.8000	0.553327	0.00621715
10	0.7750	0.695866	0.00879606
11	0.7500	0.871542	0.01224090
12	0.7250	1.091152	0.01685768
13	0.7000	1.370141	0.02309226
14	0.6750	1.731345	0.03161162
15	0.6500	2.209351	0.04344229
16	0.6250	2.858016	0.06021101
17	0.6000	3.763189	0.08456603
18	0.5750	5.063513	0.12089848
19	0.5500	6.980877	0.17648283
20	0.5250	9.855014	0.26298491
21	0.5000	14.166200	0.39792693
22	0.4750	20.544153	0.60593705
23	0.4500	29.817452	0.92132569
24	0.4250	43.181533	1.39490896
25	0.4000	62.534923	2.10791859
26	0.3750	91.087672	3.19830281
27	0.3500	134.570353	4.91408551
28	0.3250	203.942570	7.73377669
29	0.3000	322.310871	12.67514586
30	0.2750	546.041351	22.24044657
31	0.2500	1050.198792	44.24994564

COPPER

4. 1   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.9250	0.130504	0.00054988
2	0.9500	0.080999	0.00025598
3	0.9750	0.038035	0.00009154
4	1.0000	0.000703	0.00003952

COPPER

3. 1   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8750	0.257720	0.00180983
2	0.9000	0.191377	0.00118332
3	0.9250	0.133963	0.00073005
4	0.9500	0.084195	0.00042682
5	0.9750	0.040994	0.00025374
6	1.0000	0.003447	0.00019372

COPPER

4. 2   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8250	0.436267	0.00428914
2	0.8500	0.346126	0.00319610
3	0.8750	0.268387	0.00233800
4	0.9000	0.201202	0.00168275
5	0.9250	0.143029	0.00120298
6	0.9500	0.092575	0.00087526
7	0.9750	0.048752	0.00067955
8	1.0000	0.010640	0.00059855

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COPPER

ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.7250	1.091152	0.01685768
2	0.7500	0.913175	0.01405453
3	0.7750	0.761014	0.01171315
4	0.8000	0.630495	0.00976724
5	0.8250	0.518206	0.00816108
6	0.8500	0.421335	0.00684761
7	0.8750	0.337557	0.00578700
8	0.9000	0.264939	0.00494530
9	0.9250	0.201864	0.00429357
10	0.9500	0.146976	0.00380699
11	0.9750	0.099133	0.00346425
12	1.0000	0.057368	0.00324699
13	1.0250	0.020859	0.00313935

COPPER

4. 4   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.6250	2.858016	0.06021101
2	0.6500	2.443517	0.05279467
3	0.6750	2.092945	0.04644755
4	0.7000	1.794971	0.04100711
5	0.7250	1.540550	0.03633912
6	0.7500	1.322406	0.03233213
7	0.7750	1.134643	0.02889302
8	0.8000	0.972452	0.02594359
9	0.8250	0.831887	0.02341790
10	0.8500	0.709691	0.02126002
11	0.8750	0.603162	0.01942236
12	0.9000	0.510045	0.01786423
13	0.9250	0.428451	0.01655077
14	0.9500	0.356791	0.01545193
15	0.9750	0.293722	0.01454180
16	1.0000	0.238101	0.01379792
17	1.0250	0.188958	0.01320080
18	1.0500	0.145463	0.01273347
19	1.0750	0.106902	0.01238110
20	1.1000	0.072663	0.01213074
21	1.1250	0.042217	0.01197101
22	1.1500	0.015105	0.01189194

COPPER

3. 3   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.5750	5.063513	0.12089848
2	0.6000	4.355815	0.10772254
3	0.6250	3.760842	0.09636607
4	0.6500	3.257617	0.08654408
5	0.6750	2.829630	0.07802372
6	0.7000	2.463773	0.07061332
7	0.7250	2.149551	0.06415409
8	0.7500	1.878498	0.05851363
9	0.7750	1.643738	0.05358095
10	0.8000	1.439644	0.04926249
11	0.8250	1.261589	0.04547895
12	0.8500	1.105741	0.04216291
13	0.8750	0.968912	0.03925669
14	0.9000	0.848437	0.03671081
15	0.9250	0.742073	0.03448267
16	0.9500	0.647930	0.03253538
17	0.9750	0.564404	0.03083701
18	1.0000	0.490129	0.02935972

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

19	1.0000	0.490129	0.02935972
20	1.0500	0.373848	0.02698328
21	1.1000	0.293222	0.02506971
22	1.1500	0.237315	0.02353276
23	1.2000	0.197340	0.02226164
24	1.2500	0.167394	0.02118663
25	1.3000	0.143772	0.02026460
26	1.3500	0.124306	0.01946828
27	1.4000	0.107817	0.01877902
28	1.4500	0.093701	0.01818234
29	1.5000	0.081648	0.01766562
30	1.6000	0.062861	0.01679040
31	1.7000	0.050272	0.01612398
32	1.8000	0.042163	0.01559129
33	1.9000	0.036923	0.01514168
34	2.0000	0.033338	0.01474514
35	2.1000	0.030656	0.01438522
36	2.2000	0.028477	0.01405317
37	2.3000	0.026605	0.01374404
38	2.4000	0.024951	0.01345476
39	2.5000	0.023467	0.01318309
40	2.6000	0.022126	0.01292724
41	2.7000	0.020908	0.01268575
42	2.8000	0.019798	0.01245729
43	2.9000	0.018783	0.01224075
44	3.0000	0.017852	0.01203511
45	3.1000	0.016995	0.01183949
46	3.2000	0.016205	0.01165312
47	3.3000	0.015474	0.01147527
48	3.4000	0.014797	0.01130532
49	3.5000	0.014167	0.01114272
50	3.6000	0.013581	0.01098692

COPPER

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	0.490129	0.02935972
52	1.1000	0.351412	0.02935972
53	1.2000	0.275735	0.02935972
54	1.3000	0.221647	0.02935972
55	1.4000	0.176045	0.02935972
56	1.5000	0.138422	0.02935972
57	1.6000	0.110255	0.02935972
58	1.7000	0.091139	0.02935972
59	1.8000	0.078989	0.02935972
60	1.9000	0.071346	0.02935972
61	2.0000	0.066264	0.02935972
62	2.1000	0.062522	0.02935972
63	2.2000	0.059478	0.02935972
64	2.3000	0.056829	0.02935972
65	2.4000	0.054444	0.02935972
66	2.5000	0.052262	0.02935972
67	2.6000	0.050251	0.02935972
68	2.7000	0.048389	0.02935972
69	2.8000	0.046661	0.02935972
70	2.9000	0.045052	0.02935972
71	3.0000	0.043550	0.02935972

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.5250	9.855014	0.26298491
2	0.5500	8.511485	0.23730011
3	0.5750	7.389441	0.21505599
4	0.6000	6.445495	0.19569649
5	0.6250	5.646054	0.17877227
6	0.6500	4.964926	0.16391722
7	0.6750	4.381041	0.15083061
8	0.7000	3.878139	0.13926367
9	0.7250	3.442812	0.12900905
10	0.7500	3.064281	0.11989319
11	0.7750	2.733752	0.11176968
12	0.8000	2.444008	0.10451441
13	0.8250	2.189084	0.09802170
14	0.8500	1.964023	0.09220112
15	0.8750	1.764683	0.08697492
16	0.9000	1.587589	0.08227600
17	0.9250	1.429803	0.07804622
18	0.9500	1.288839	0.07423501
19	0.9750	1.162579	0.07079823
20	1.0000	1.049212	0.06769728

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU = 0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
21	1.0000	1.049212	0.06769728
22	1.0500	0.859986	0.06238450
23	1.1000	0.710659	0.05787004
24	1.1500	0.592764	0.05410001
25	1.2000	0.497566	0.05092953
26	1.2500	0.419534	0.04825169
27	1.3000	0.354776	0.04598523
28	1.3500	0.300693	0.04406551
29	1.4000	0.255524	0.04243849
30	1.4500	0.217998	0.04105728
31	1.5000	0.187104	0.03988039
32	1.6000	0.141552	0.03794948
33	1.7000	0.112678	0.03648377
34	1.8000	0.094713	0.03530405
35	1.9000	0.083246	0.03429938
36	2.0000	0.075264	0.03340722
37	2.1000	0.069401	0.03259428
38	2.2000	0.064506	0.03184281
39	2.3000	0.060280	0.03114267
40	2.4000	0.056535	0.03048728
41	2.5000	0.053173	0.02987172
42	2.6000	0.050135	0.02929200
43	2.7000	0.047376	0.02874479
44	2.8000	0.044861	0.02822714
45	2.9000	0.042561	0.02773646
46	3.0000	0.040451	0.02727051
47	3.1000	0.038510	0.02682727
48	3.2000	0.036719	0.02640495
49	3.3000	0.035063	0.02600197
50	3.4000	0.033528	0.02561689

COPPER

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	1.049212	0.06769728
52	1.1000	0.825164	0.06769728
53	1.2000	0.655603	0.06769728
54	1.3000	0.513958	0.06769728
55	1.4000	0.397000	0.06769728
56	1.5000	0.307474	0.06769728
57	1.6000	0.244890	0.06769728
58	1.7000	0.204353	0.06769728
59	1.8000	0.179121	0.06769728
60	1.9000	0.163157	0.06769728
61	2.0000	0.152256	0.06769728
62	2.1000	0.143976	0.06769728
63	2.2000	0.137084	0.06769728
64	2.3000	0.131019	0.06769728
65	2.4000	0.125531	0.06769728
66	2.5000	0.120503	0.06769728
67	2.6000	0.115867	0.06769728
68	2.7000	0.111575	0.06769728
69	2.8000	0.107590	0.06769728
70	2.9000	0.103880	0.06769728
71	3.0000	0.100418	0.06769728

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.4250	43.181533	1.37490896
2	0.4500	37.176691	1.28270882
3	0.4750	32.266514	1.18568957
4	0.5000	28.208096	1.10115655
5	0.5250	24.821124	1.02699797
6	0.5500	21.969724	0.96153835
7	0.5750	19.550090	0.90343348
8	0.6000	17.481928	0.85159396
9	0.6250	15.702427	0.80512872
10	0.6500	14.161935	0.76330271
11	0.6750	12.820831	0.72550487
12	0.7000	11.647218	0.69122352
13	0.7250	10.615207	0.66002738
14	0.7500	9.703627	0.63155066
15	0.7750	8.895042	0.60548133
16	0.8000	8.174999	0.58155182
17	0.8250	7.531446	0.55953148
18	0.8500	6.954270	0.53922061
19	0.8750	6.434944	0.52044550
20	0.9000	5.966239	0.50305443
21	0.9250	5.542001	0.48691438
22	0.9500	5.156962	0.47190829
23	0.9750	4.806596	0.45793276
24	1.0000	4.487001	0.44489620

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

25	1.0000	4.487001	0.44489620
26	1.0500	3.912744	0.42137198
27	1.1000	3.404947	0.40077291
28	1.1500	2.957557	0.38284780
29	1.2000	2.565496	0.36727960
30	1.2500	2.224654	0.35377502
31	1.3000	1.931316	0.34206044
32	1.3500	1.681755	0.33188094
33	1.4000	1.471997	0.32300149
34	1.4500	1.297772	0.31520908
35	1.5000	1.154584	0.30831480
36	1.6000	0.943370	0.29664405
37	1.7000	0.804300	0.28691529
38	1.8000	0.710265	0.27846689
39	1.9000	0.642630	0.27090411
40	2.0000	0.590167	0.26400176
41	2.1000	0.546782	0.25762989
42	2.2000	0.509375	0.25170764
43	2.3000	0.476363	0.24617861
44	2.4000	0.446867	0.24099924
45	2.5000	0.420321	0.23613365
46	2.6000	0.396309	0.23155124
47	2.7000	0.374501	0.22722555
48	2.8000	0.354623	0.22313348
49	2.9000	0.336443	0.21925474
50	3.0000	0.319764	0.21557141

COPPER

EXPANSION PHASE — ISOENERGY ABOVE ESLIM

51	1.0000	4.487001	0.44489620
52	1.1000	3.660392	0.44489620
53	1.2000	2.943886	0.44489620
54	1.3000	2.356466	0.44489620
55	1.4000	1.907551	0.44489620
56	1.5000	1.587007	0.44489620
57	1.6000	1.369301	0.44489620
58	1.7000	1.223921	0.44489620
59	1.8000	1.124167	0.44489620
60	1.9000	1.051032	0.44483620
61	2.0000	0.992952	0.44489620
62	2.1000	0.943697	0.44489620
63	2.2000	0.900167	0.44489620
64	2.3000	0.860844	0.44489620
65	2.4000	0.824927	0.44489620
66	2.5000	0.791918	0.44489620
67	2.6000	0.761458	0.44489620
68	2.7000	0.733255	0.44489620
69	2.8000	0.707067	0.44489620
70	2.9000	0.682686	0.44489620
71	3.0000	0.659929	0.44489620

5. 5 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2750	546.041351	22.24044657
2	0.3000	455.474777	20.84974694
3	0.3250	386.375156	19.67042436
4	0.3500	332.445068	18.67674375
5	0.3750	289.530212	17.00897260
6	0.4000	254.803589	17.04879665
7	0.4250	226.289063	16.37641764
8	0.4500	202.572466	15.77665746
9	0.4750	182.620649	15.23768497
10	0.5000	165.664862	14.75014150
11	0.5250	151.123608	14.30652547
12	0.5500	138.550524	13.90075231
13	0.5750	127.598334	13.52783346
14	0.6000	117.993672	13.18363893
15	0.6250	109.518790	12.86471915
16	0.6500	101.998631	12.56816924
17	0.6750	95.291087	12.29152465
18	0.7000	89.279790	12.03268003
19	0.7250	83.868745	11.78982544
20	0.7500	78.978109	11.56139576
21	0.7750	74.541080	11.34603012
22	0.8000	70.501372	11.14253902
23	0.8250	66.811301	10.94987810
24	0.8500	63.430227	10.76712608
25	0.8750	60.323345	10.59346724
26	0.9000	57.460693	10.42817593
27	0.9250	54.916362	10.27060485
28	0.9500	52.367851	10.12017417
29	0.9750	50.095533	9.97636294
30	1.0000	47.982234	9.83870184

EXPANSION PHASE — ISENTROPE ABOVE ESLIM   BMU = 0.

31	1.0000	47.982234	9.83870184
32	1.0500	44.142889	9.58045304
33	1.1000	40.736135	9.34256208
34	1.1500	37.706659	9.12248031
35	1.2000	35.009181	8.91882718
36	1.2500	32.605287	8.72925401
37	1.3000	30.461456	8.55241191
38	1.3500	28.547743	8.38692904
39	1.4000	26.836995	8.23159266
40	1.4500	25.304453	8.08533549
41	1.5000	23.927608	7.94722283
42	1.6000	21.563622	7.69282132
43	1.7000	19.607481	7.46238732
44	1.8000	17.957978	7.25198895
45	1.9000	16.542865	7.05865407
46	2.0000	15.311760	6.88008070
47	2.1000	14.229287	6.71443212
48	2.2000	13.269800	6.56020242
49	2.3000	12.413895	6.41613144
50	2.4000	11.646315	6.28114945

COPPER

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	47.902234	9.83870184
52	1.1000	42.747500	9.83870184
53	1.2000	38.425020	9.83870184
54	1.3000	34.868076	9.83870184
55	1.4000	31.947559	9.83870184
56	1.5000	29.540241	9.83870184
57	1.6000	27.532465	9.83870184
58	1.7000	25.828103	9.83870184
59	1.8000	24.353015	9.83870184
60	1.9000	23.054069	9.83870184
61	2.0000	21.894705	9.83870184
62	2.1000	20.849767	9.83870184
63	2.2000	19.901312	9.83870184
64	2.3000	19.035825	9.83870184
65	2.4000	18.242610	9.83870184
66	2.5000	17.512893	9.83870184
67	2.6000	16.839317	9.83870184
68	2.7000	16.215638	9.83870184
69	2.8000	15.636509	9.83870184
70	2.9000	15.097319	9.83870184
71	3.0000	14.594075	9.83870184

IRON

AC = 5   WC = 5   a = .5

RG	RHOIN	AMU	BMU	ESUBO
1.5000	7.8600	1.2790	1.0500	0.0950000

5   HUGONIOT PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	1.0000	0.	0.
2	0.9750	0.034366	0.00005465
3	0.9500	0.074119	0.00023574
4	0.9250	0.120324	0.00057406
5	0.9000	0.174305	0.00110881
6	0.8750	0.237721	0.00189027
7	0.8500	0.312662	0.00298341
8	0.8250	0.401792	0.00447287
9	0.8000	0.508524	0.00646976
10	0.7750	0.637273	0.00912127
11	0.7500	0.793797	0.01262400
12	0.7250	0.985657	0.01724271
13	0.7000	1.222849	0.02333681
14	0.6750	1.518667	0.03139737
15	0.6500	1.890860	0.04209929
16	0.6250	2.363202	0.05637407
17	0.6000	2.967619	0.07551192
18	0.5750	3.747135	0.10130612
19	0.5500	4.760102	0.13626245
20	0.5250	6.086581	0.18391385
21	0.5000	7.838427	0.24931382
22	0.4750	10.175815	0.33984111
23	0.4500	13.335111	0.46655919
24	0.4250	17.677354	0.64659527
25	0.4000	23.776140	0.90748618
26	0.3750	32.585891	1.29555854
27	0.3500	45.787696	1.89325702
28	0.3250	66.568596	2.85838413
29	0.3000	101.609269	4.52458549
30	0.2750	167.140163	7.70843577
31	0.2500	313.423588	14.95341432
32	0.2250	797.126678	39.29854536
33	0.2000	61971.000000	223.75000000

IRON

5. 1   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8750	0.217721	0.00189027
2	0.9000	0.176494	0.00123599
3	0.9250	0.123502	0.00076276
4	0.9500	0.077586	0.00044630
5	0.9750	0.037762	0.00026578
6	1.0000	0.003189	0.00020318

IRON

5. 2   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.7250	0.985657	0.01724271
2	0.7500	0.826535	0.01437287
3	0.7750	0.689839	0.01197158
4	0.8000	0.572098	0.00997337
5	0.8250	0.470442	0.00832280
6	0.8500	0.382488	0.00697269
7	0.8750	0.306244	0.00588284
8	0.9000	0.240037	0.00501877
9	0.9250	0.182457	0.00435094
10	0.9500	0.132307	0.00385390
11	0.9750	0.088571	0.00350571
12	1.0000	0.050382	0.00328741
13	1.0250	0.016995	0.00318261

- 3   ISENTROPE PRESSURES

	V/V0	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.5750	3.693687	0.09966112
2	0.6000	3.187228	0.08896489
3	0.6250	2.758330	0.07954752
4	0.6500	2.393060	0.07138636
5	0.6750	2.080367	0.06429799
6	0.7000	1.811414	0.05813032
7	0.7250	1.579075	0.05275638
8	0.7500	1.377559	0.04806959
9	0.7750	1.202130	0.04397995
10	0.8000	1.048886	0.04041110
11	0.8250	0.914595	0.03729795
12	0.8500	0.796562	0.03458476
13	0.8750	0.692531	0.03222363
14	0.9000	0.600601	0.03017320
15	0.9250	0.519164	0.02839771
16	0.9500	0.446853	0.02686605
17	0.9750	0.382503	0.02555115
18	1.0000	0.325115	0.02442937

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

	V/V0	PRESSURE (MB)	ENERGY (MB-CC/GM)
19	1.0000	0.325115	0.02442937
20	1.0500	0.228485	0.02187435
21	1.1000	0.165329	0.01984555
22	1.1500	0.124488	0.01816528
23	1.2000	0.097843	0.01671852
24	1.2500	0.079914	0.01544283
25	1.3000	0.067273	0.01431669
26	1.3500	0.057898	0.01334304
27	1.4000	0.050622	0.01252916
28	1.4500	0.044748	0.01187120
29	1.5000	0.039858	0.01135074
30	1.6000	0.031914	0.01053184
31	1.7000	0.025394	0.00964747
32	1.8000	0.021592	0.00922554
33	1.9000	0.019084	0.00893423
34	2.0000	0.017309	0.0086 470
35	2.1000	0.015947	0.00848179
36	2.2000	0.014824	0.00828623
37	2.3000	0.013853	0.00810418
38	2.4000	0.012995	0.00793371
39	2.5000	0.012220	0.00777356
40	2.6000	0.011522	0.00762272
41	2.7000	0.010888	0.00748032
42	2.8000	0.010310	0.00734561
43	2.9000	0.009782	0.00721791
44	3.0000	0.009297	0.00709666
45	3.1000	0.008351	0.00698131
46	3.2000	0.008439	0.00687142
47	3.3000	0.008058	0.00676655
48	3.4000	0.007706	0.00666634
49	3.5000	0.007378	0.00657045
50	3.6000	0.007072	0.00647859

IRON

EXPANSION PHASE - TRUENERGY ABOVE ESLIM

51	1.0000	0.325715	0.02442937
52	1.1000	0.210157	0.02442937
53	1.2000	0.159209	0.02442937
54	1.3000	0.130334	0.02442937
55	1.4000	0.107817	0.02442937
56	1.5000	0.088828	0.02442937
57	1.6000	0.074001	0.02442937
58	1.7000	0.063490	0.02442937
59	1.8000	0.056471	0.02442937
60	1.9000	0.051783	0.02442937
61	2.0000	0.048453	0.02442937
62	2.1000	0.045863	0.02442937
63	2.2000	0.043682	0.02442937
64	2.3000	0.041753	0.02442937
65	2.4000	0.040006	0.02442937
66	2.5000	0.038404	0.02442937
67	2.6000	0.036926	0.02442937
68	2.7000	0.035558	0.02442937
69	2.8000	0.034288	0.02442937
70	2.9000	0.033106	0.02442937
71	3.0000	0.032002	0.02442937

5. 4   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/CM)
1	0.4250	17.677354	0.64659527
2	0.4500	15.195726	0.59464379
3	0.4750	13.163602	0.54979720
4	0.5000	11.481963	0.51080243
5	0.5250	10.077134	0.47667540
6	0.5500	8.893477	0.44663386
7	0.5750	7.888397	0.42004919
8	0.6000	7.028890	0.39641114
9	0.6250	6.289090	0.37530175
10	0.6500	5.648519	0.35637587
11	0.6750	5.090810	0.33934619
12	0.7000	4.602771	0.32397194
13	0.7250	4.173679	0.31004998
14	0.7500	3.794755	0.29740789
15	0.7750	3.458763	0.28589848
16	0.8000	3.159698	0.27539546
17	0.8250	2.892546	0.26578993
18	0.8500	2.653099	0.25698756
19	0.8750	2.437805	0.24890624
20	0.9000	2.243650	0.24147427
21	0.9250	2.068068	0.23462875
22	0.9500	1.908859	0.22831433
23	0.9750	1.764135	0.22248211
24	1.0000	1.632265	0.21708877

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/CM)
25	1.0000	1.632265	0.21708877
26	1.0500	1.404925	0.20749404
27	1.1000	1.216797	0.19875008
28	1.1500	1.060990	0.19111087
29	1.2000	0.930583	0.18440743
30	1.2500	0.820562	0.17850518
31	1.3000	0.727334	0.17329273
32	1.3500	0.648285	0.16867419
33	1.4000	0.581414	0.16456467
34	1.4500	0.525074	0.16088822
35	1.5000	0.477814	0.15757714
36	1.6000	0.404831	0.15163921
37	1.7000	0.353715	0.14664856
38	1.8000	0.316771	0.14230718
39	1.9000	0.288596	0.13842580
40	2.0000	0.265832	0.13488982
41	2.1000	0.246575	0.13163004
42	2.2000	0.229798	0.12860258
43	2.3000	0.214932	0.12577713
44	2.4000	0.201630	0.12313072
45	2.5000	0.189654	0.12064476
46	2.6000	0.178820	0.11830352
47	2.7000	0.168980	0.11609345
48	2.8000	0.160011	0.11400273
49	2.9000	0.151808	0.11202102
50	3.0000	0.144282	0.11013915

IRON

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	1.632265	0.21708877
52	1.1000	1.296378	0.21708877
53	1.2000	1.053759	0.21708877
54	1.3000	0.872491	0.21708877
55	1.4000	0.737110	0.21708877
56	1.5000	0.638346	0.21708877
57	1.6000	0.567879	0.21708877
58	1.7000	0.517572	0.21708877
59	1.8000	0.480450	0.21708877
60	1.9000	0.451451	0.21708877
61	2.0000	0.427401	0.21708877
62	2.1000	0.406519	0.21708877
63	2.2000	0.387870	0.21708877
64	2.3000	0.370957	0.21708877
65	2.4000	0.355487	0.21708877
66	2.5000	0.341264	0.21708877
67	2.6000	0.328138	0.21708877
68	2.7000	0.315985	0.21708377
69	2.8000	0.304700	0.21708877
70	2.9000	0.294193	0.21708877
71	3.0000	0.284386	0.21708877

5. 5   ISENTROPE PRESSURES

	V/VC	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2750	187.140163	7.70843577
2	0.3000	139.559484	7.22614527
3	0.3250	118.476117	6.81957978
4	0.3500	101.992570	6.47167885
5	0.3750	88.855114	6.17016250
6	0.4000	78.209140	5.90597147
7	0.4250	69.456697	5.67227829
8	0.4500	62.168721	5.46384054
9	0.4750	56.031594	5.27656579
10	0.5000	50.811557	5.10721219
11	0.5250	46.331538	4.95317793
12	0.5500	42.455436	4.81235009
13	0.5750	39.077235	4.68299437
14	0.6000	36.113358	4.56367356
15	0.6250	33.497182	4.45318598
16	0.6500	31.175072	4.35051888
17	0.6750	29.103444	4.25481242
18	0.7000	27.246579	4.16333148
19	0.7250	25.574972	4.08144367
20	0.7500	24.064076	4.00260186
21	0.7750	22.693328	3.92833003
22	0.8000	21.445392	3.85821199
23	0.8250	20.305568	3.79188213
24	0.8500	19.251322	3.72901782
25	0.8750	18.301913	3.66933325
26	0.9000	17.418088	3.61257425
27	0.9250	16.601842	3.55851391
28	0.9500	15.846220	3.50694901
29	0.9750	15.145153	3.45769688
30	1.0000	14.493327	3.41059297

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

	V/VC	PRESSURE	ENERGY
31	1.0000	14.493327	3.41059297
32	1.0500	13.319594	3.32234725
33	1.1000	12.293847	3.24105167
34	1.1500	11.392038	3.16585520
35	1.2000	10.594929	3.09603775
36	1.2500	9.887113	3.03098804
37	1.3000	9.256126	2.97018203
38	1.3500	8.691719	2.91316682
39	1.4000	8.185290	2.85954848
40	1.4500	7.729479	2.80898321
41	1.5000	7.317890	2.76117046
42	1.6000	6.606049	2.67294237
43	1.7000	6.012321	2.59293982
44	1.8000	5.508999	2.51985583
45	1.9000	5.075882	2.45268467
46	2.0000	4.698507	2.39063734
47	2.1000	4.366468	2.33307946
48	2.2000	4.072073	2.27948898
49	2.3000	3.809434	2.22942829
50	2.4000	3.573890	2.18252578

IRON

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	14.493327	3.41059297
52	1.1000	12.900492	3.41059297
53	1.2000	11.626099	3.41059297
54	1.3000	10.588290	3.41059297
55	1.4000	9.732638	3.41039297
56	1.5000	9.019646	3.41059297
57	1.6000	8.418036	3.41059297
58	1.7000	7.902601	3.41059297
59	1.8000	7.453799	3.41059297
60	1.9000	7.057248	3.41059297
61	2.0000	6.702723	3.41059297
62	2.1000	6.382958	3.41059297
63	2.2000	6.092636	3.41059297
64	2.3000	5.827685	3.41059297
65	2.4000	5.584850	3.41059297
66	2.5000	5.361453	3.41059297
67	2.6000	5.155243	3.41059297
68	2.7000	4.964308	3.41059297
69	2.8000	4.787011	3.41059297
70	2.9000	4.621942	3.41059297
71	3.0000	4.467877	3.41059297

5. 6 'SENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2250	797.126678	39.29854536
2	0.2500	663.836983	37.00351858
3	0.2750	563.845528	35.06995869
4	0.3000	486.616745	33.41243553
5	0.3250	425.525955	31.97118163
6	0.3500	376.227753	30.70302200
7	0.3750	335.769039	29.57591581
8	0.4000	302.081741	28.56553268
9	0.4250	273.679707	27.65302777
10	0.4500	249.470819	26.82355261
11	0.4750	228.636593	26.06522918
12	0.5000	210.552996	25.36842918
13	0.5250	194.736794	24.72525406
14	0.5500	180.808704	24.12915611
15	0.5750	168.467266	23.57465506
16	0.6000	157.470224	23.05712461
17	0.6250	147.620897	22.57262850
18	0.6500	138.758127	22.11779356
19	0.6750	130.748743	21.68971062
20	0.7000	123.481839	21.28585482
21	0.7250	116.864386	20.90402317
22	0.7500	110.817842	20.54228377
23	0.7750	105.275470	20.19893408
24	0.8000	100.180240	19.87246680
25	0.8250	95.483178	19.56154275
26	0.8500	91.141989	19.26496649
27	0.8750	87.119997	18.98166800
28	0.9000	83.385245	18.71068573
29	0.9250	79.909784	18.45115304
30	0.9500	76.669065	18.20223624
31	0.9750	73.641450	17.96337485
32	1.0000	70.807808	17.73377299

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

33	1.0000	70.807808	17.73377299
34	1.0500	65.657516	17.30057359
35	1.1000	61.102086	16.89812803
36	1.1500	57.050198	16.52294683
37	1.2000	53.427894	16.17208314
38	1.2500	50.174767	15.84301329
39	1.3000	47.241050	15.53356016
40	1.3500	44.585335	15.24183393
41	1.4000	42.172812	14.96618497
42	1.4500	39.973942	14.70516682
43	1.5000	37.963444	14.45750606
44	1.6000	34.425171	13.99859011
45	1.7000	31.414344	13.58100629
46	1.8000	28.924768	13.19880068
47	1.9000	26.576111	12.84718549
48	2.0000	24.607148	12.52225721
49	2.1000	22.870615	12.22079039
50	2.2000	21.329415	11.94008732

IRON

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	70.807808	17.73377299
52	1.1000	64.087790	17.73377299
53	1.2000	58.542617	17.73377299
54	1.3000	53.892608	17.73377299
55	1.4000	49.941920	17.73377299
56	1.5000	46.547314	17.73377299
57	1.6000	43.599739	17.73377299
58	1.7000	41.014575	17.73377299
59	1.8000	38.726129	17.73377299
60	1.9000	36.683633	17.73377299
61	2.0000	34.847777	17.73377299
62	2.1000	33.187768	17.73377299
63	2.2000	31.679044	17.73377299
64	2.3000	30.301641	17.73377299
65	2.4000	29.039058	17.73377299
66	2.5000	27.877492	17.73377299
67	2.6000	26.805280	17.73377299
68	2.7000	25.812492	17.73377299
69	2.8000	24.890618	17.73377299
70	2.9000	24.032320	17.73377299
71	3.0000	23.231243	17.73377299

ALUMINUM

AC = 5   WC = 5   a = .5

RS	RHOIN	RMU	BMU	ESUB0
1.6300	2.7000	0.7520	0.6500	0.0500000

7   HUGONIOT PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	1.0000	0.	0.
2	0.9750	0.020262	0.00009380
3	0.9500	0.043622	0.00040576
4	0.9250	0.071327	0.00099064
5	0.9000	0.103551	0.00191762
6	0.8750	0.141425	0.00327371
7	0.8500	0.186056	0.00516822
8	0.8250	0.238769	0.00773787
9	0.8000	0.301138	0.01115324
10	0.7750	0.375045	0.01562689
11	0.7500	0.462751	0.02142363
12	0.7250	0.566990	0.02887449
13	0.7000	0.691122	0.03839567
14	0.6750	0.839329	0.05051517
15	0.6500	1.016904	0.06591043
16	0.6250	1.230654	0.08546208
17	0.6000	1.489475	0.11033148
18	0.5750	1.805177	0.14207409
19	0.5500	2.193696	0.18280797
20	0.5250	2.676918	0.23546965
21	0.5000	3.285497	0.30421264
22	0.4750	4.063334	0.39504634
23	0.4500	5.074969	0.51689497
24	0.4250	6.418240	0.68342369
25	0.4000	8.247051	0.91633895
26	0.3750	10.814717	1.25170325
27	0.3500	14.562638	1.75291002
28	0.3250	20.319247	2.53990570
29	0.3000	29.805367	3.86368430
30	0.2750	47.171001	6.33314323
31	0.2500	85.189006	11.83180547
32	0.2250	208.829443	29.97089005
33	0.2000	47897.000000	057.50000000

ALUMINUM

7. 1 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8750	0.141425	0.00327371
2	0.9000	0.104910	0.00214093
3	0.9250	0.073329	0.00132243
4	0.9500	0.046026	0.00077569
5	0.9750	0.022427	0.00046388
6	1.0000	0.002031	0.00035509

ALUMINUM

7. 2 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.7250	0.566990	0.02887449
2	0.7500	0.477306	0.02405993
3	0.7750	0.399615	0.02001717
4	0.8000	0.332192	0.01664371
5	0.8250	0.273598	0.01385159
6	0.8500	0.222622	0.01156501
7	0.8750	0.178237	0.00971848
8	0.9000	0.139569	0.00825523
9	0.9250	0.105866	0.00712600
10	0.9500	0.076476	0.00628797
11	0.9750	0.050835	0.00570395
12	1.0000	0.028450	0.00534159
13	1.0250	0.008891	0.00517283

ALUMINUM

7.3   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.5750	1.805177	0.14207409
2	0.6000	1.560712	0.12656316
3	0.6250	1.352453	0.11313520
4	0.6500	1.174082	0.10148694
5	0.6750	1.020562	0.09136704
6	0.7000	0.887840	0.08256574
7	0.7250	0.772632	0.07490693
8	0.7500	0.672255	0.06824183
9	0.7750	0.584500	0.06244415
10	0.8000	0.507539	0.05740607
11	0.8250	0.439849	0.05303520
12	0.8500	0.380153	0.04925202
13	0.8750	0.327374	0.04598781
14	0.9000	0.280601	0.04318303
15	0.9250	0.239058	0.04078586
16	0.9500	0.202080	0.03875114
17	0.9750	0.169099	0.03703938
18	1.0000	0.139622	0.03561600

EXPANSION PHASE — ISENTROPE ABOVE ESLIM   BMU = 0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
19	1.0000	0.139622	0.03561600
20	1.0500	0.095373	0.03353342
21	1.1000	0.074747	0.03462400
22	1.1500	0.062792	0.03545671
23	1.2000	0.056141	0.03617236
24	1.2500	0.052398	0.03685540
25	1.3000	0.050049	0.03756712
26	1.3500	0.048273	0.03837033
27	1.4000	0.046754	0.03936218
28	1.4500	0.045578	0.04076460
29	1.5000	0.045565	0.04344599
30	1.6000	0.041888	0.04505307
31	1.7000	0.044378	0.05322675
32	1.8000	0.038453	0.05003610
33	1.9000	0.034577	0.04815067
34	2.0000	0.031675	0.04673506
35	2.1000	0.029316	0.04553938
36	2.2000	0.027300	0.04446952
37	2.3000	0.025527	0.04348547
38	2.4000	0.023945	0.04256850
39	2.5000	0.022523	0.04170854
40	2.6000	0.021236	0.04089902
41	2.7000	0.020067	0.04013494
42	2.8000	0.019002	0.03941215
43	2.9000	0.018028	0.03872705
44	3.0000	0.017134	0.03807646
45	3.1000	0.016312	0.03745759
46	3.2000	0.015554	0.03686793
47	3.3000	0.014852	0.03630526
48	3.4000	0.014202	0.03576759
49	3.5000	0.013598	0.03525312
50	3.6000	0.013035	0.03476021

ALUMINUM

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	0.139622	0.03561600
52	1.1000	0.0?7068	0.03561600
53	1.2000	0.055111	0.03561600
54	1.3000	0.047181	0.03561600
55	1.4000	0.042274	0.03561600
56	1.5000	0.037662	0.03561600
57	1.6000	0.033465	0.03561600
58	1.7000	0.030078	0.03561600
59	1.8000	0.027536	0.0?561600
60	1.9000	0.025640	0.03561600
61	2.0000	0.024161	0.03561600
62	2.1000	0.022935	0.03561600
63	2.2000	0.021866	0.03561600
64	2.3000	0.020908	0.03561600
65	2.4000	0.020035	0.03561600
66	2.5000	0.019233	0.03561600
67	2.6000	0.018493	0.03561600
68	2.7000	0.017808	0.03561600
69	2.8000	0.017172	0.03561600
70	2.9000	0.016580	0.03561600
71	3.0000	0.016027	0.03561600

7. 4   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.4250	6.418240	0.68342369
2	0.4500	5.509560	0.62856735
3	0.4750	4.763815	0.58128902
4	0.5000	4.145503	0.54026554
5	0.5250	3.628119	0.50445458
6	0.5500	3.191587	0.47302533
7	0.5750	2.820491	0.44530839
8	0.6000	2.502855	0.42075913
9	0.6250	2.229268	0.39893051
10	0.6500	1.992262	0.37945259
11	0.6750	1.785855	0.36201692
12	0.7000	1.605215	0.34636453
13	0.7250	1.446405	0.33227664
14	0.7500	1.306198	0.31956729
15	0.7750	1.181929	0.30807757
16	0.8000	1.071381	0.29767098
17	0.8250	0.972702	0.28822965
18	0.8500	0.884334	0.27965146
19	0.8750	0.804962	0.27184743
20	0.9000	0.733468	0.26473981
21	0.9250	0.668897	0.25826038
22	0.9500	0.610433	0.25234904
23	0.9750	0.557372	0.24695273
24	1.0000	0.509106	0.24202440

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
25	1.0000	0.509106	0.24202440
26	1.0500	0.429781	0.23343789
27	1.1000	0.368778	0.22440926
28	1.1500	0.322768	0.21645918
29	1.2000	0.287237	0.20938387
30	1.2500	0.258970	0.20304615
31	1.3000	0.235789	0.19735049
32	1.3500	0.216282	0.19222371
33	1.4000	0.199557	0.18760261
34	1.4500	0.185055	0.18342792
35	1.5000	0.172407	0.17964268
36	1.6000	0.150868	0.17210498
37	1.7000	0.134540	0.16602869
38	1.8000	0.121835	0.16090813
39	1.9000	0.111588	0.15642423
40	2.0000	0.103016	0.15238794
41	2.1000	0.095634	0.14868953
42	2.2000	0.089153	0.14526416
43	2.3000	0.083393	0.14207087
44	2.4000	0.078234	0.13908114
45	2.5000	0.073588	0.13627300
46	2.6000	0.069384	0.13362845
47	2.7000	0.065566	0.13113208
48	2.8000	0.062086	0.12877055
49	2.9000	0.058903	0.12653212
50	3.0000	0.055983	0.12440646

ALUMINUM

EXPANSION PHASE — ISOENERGY ABOVE ESLIM

51	1.0000	0.509106	0.24202440
52	1.1000	0.391916	0.24202440
53	1.2000	0.325707	0.24202440
54	1.3000	0.283551	0.24202440
55	1.4000	0.252912	0.24202440
56	1.5000	0.229036	0.24202440
57	1.6000	0.210105	0.24202440
58	1.7000	0.194996	0.24202440
59	1.8000	0.182715	0.24202440
60	1.9000	0.172424	0.24202440
61	2.0000	0.163526	0.24202440
62	2.1000	0.155637	0.24202440
63	2.2000	0.148529	0.24202440
64	2.3000	0.142061	0.24202440
65	2.4000	0.136140	0.24202440
66	2.5000	0.130693	0.24202440
67	2.6000	0.125667	0.24202440
68	2.7000	0.121012	0.24202440
69	2.8000	0.116690	0.24202440
70	2.9000	0.112667	0.24202440
71	3.0000	0.108911	0.24202440

7. 5 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2750	47.171001	6.33314323
2	0.3000	39.460216	5.93646836
3	0.3250	33.544351	5.60154796
4	0.3500	28.904017	5.31463456
5	0.3750	25.194880	5.06579608
6	0.4000	22.181474	4.84767967
7	0.4250	19.698415	4.65472591
8	0.4500	17.626801	4.48265284
9	0.4750	15.879375	4.32810855
10	0.5000	14.390933	4.18843091
11	0.5250	13.111948	4.06147826
12	0.5500	12.004257	3.94550756
13	0.5750	11.038057	3.83908531
14	0.6000	10.189801	3.74102139
15	0.6250	9.440679	3.65031913
16	0.6500	8.775515	3.56613728
17	0.6750	8.181955	3.48776066
18	0.7000	7.649858	3.41457716
19	0.7250	7.170833	3.34605965
20	0.7500	6.737886	3.28175157
21	0.7750	6.345152	3.22125548
22	0.8000	5.987681	3.16422358
23	0.8250	5.661269	3.11035015
24	0.8500	5.362328	3.05936536
25	0.8750	5.087781	3.01102999
26	0.9000	4.834973	2.96513125
27	0.9250	4.601607	2.92147914
28	0.9500	4.385685	2.87990338
29	0.9750	4.185462	2.84025103
30	1.0000	3.999411	2.80238420

EXPANSION PHASE — ISENTROPE ABOVE ESLIM   BMU = 0.

31	1.0000	3.999411	2.80238420
32	1.0500	3.669179	2.73160305
33	1.1000	3.387733	2.66632801
34	1.1500	3.145 07	2.60587260
35	1.2000	2.933412	2.54960197
36	1.2500	2.746628	2.49700812
37	1.3000	2.580232	2.44767854
38	1.3500	2.430836	2.40127185
39	1.4000	2.295885	2.35749993
40	1.4500	2.173404	2.31611511
41	1.5000	2.061816	2.27690157
42	1.6000	1.866367	2.20430806
43	1.7000	1.701158	2.13838682
44	1.8000	1.559874	2.07812941
45	1.9000	1.437693	2.02273551
46	2.0000	1.330973	1.97156447
47	2.1000	1.236971	1.92409579
48	2.2000	1.153599	1.87989931
49	2.3000	1.079190	1.83861405
50	2.4000	1.012463	1.79993340

ALUMINUM

EXPANSION PHASE – ISOENERGY ABOVE ESLIM

51	1.0000	3.999411	2.80238420
52	1.1000	3.55482	2.80238420
53	1.2000	3.21791	2.80238420
54	1.3000	2.948675	2.80238420
55	1.4000	2.724942	2.80238420
56	1.5000	2.534784	2.80238420
57	1.6000	2.371010	2.80238420
58	1.7000	2.228457	2.80238420
59	1.8000	2.103068	2.80238420
60	1.9000	1.991655	2.80238420
61	2.0000	1.891777	2.80238420
62	2.1000	1.801585	2.80238420
63	2.2000	1.719659	2.80238420
64	2.3000	1.644881	2.80238420
65	2.4000	1.576342	2.80238420
66	2.5000	1.513288	2.80238420
67	2.6000	1.455084	2.80238420
68	2.7000	1.401192	2.80238420
69	2.8000	1.351150	2.80238420
70	2.9000	1.304558	2.80238420
71	3.0000	1.261073	2.80238420

8. 6   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2500	85.189006	11.83180547
2	0.2750	71.060966	11.11686742
3	0.3000	60.348579	10.51423514
4	0.3250	52.016564	9.99807513
5	0.3500	45.396222	9.55002844
6	0.3750	40.039748	9.15667784
7	0.4000	35.637901	8.80798030
8	0.4250	31.971395	8.49626160
9	0.4500	28.881103	8.21355054
10	0.4750	26.249198	7.96112722
11	0.5000	23.986856	7.72920787
12	0.5250	22.026041	7.51672131
13	0.5500	20.313894	7.32114643
14	0.5750	18.808814	7.14039290
15	0.6000	17.477675	6.97271144
16	0.6250	16.293823	6.81662625
17	0.6500	15.235601	6.67088258
18	0.6750	14.285254	6.53440624
19	0.7000	13.428112	6.40627176
20	0.7250	12.651956	6.28567696
21	0.7500	11.946544	6.17192292
22	0.7750	11.303230	6.06439751
23	0.8000	10.714674	5.96256202
24	0.8250	10.174612	5.86594033
25	0.8500	9.677663	5.77410990
26	0.8750	9.219192	5.68669438
27	0.9000	8.795178	5.60335720
28	0.9250	8.402125	5.52379638
29	0.9500	8.036976	5.44774026
30	0.9750	7.697052	5.37494349
31	1.0000	7.379994	5.30518407

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
32	1.0000	7.379994	5.30518407
33	1.0500	6.810994	5.17412102
34	1.1000	6.317684	5.05277920
35	1.1500	5.885980	4.93995184
36	1.2000	5.504708	4.83461410
37	1.2500	5.165146	4.73592323
38	1.3000	4.860531	4.64317751
39	1.3500	4.585606	4.55578440
40	1.4000	4.336241	4.47323662
41	1.4500	4.109130	4.39509416
42	1.5000	3.901564	4.32097167
43	1.6000	3.536470	4.18364650
44	1.7000	3.226171	4.05875576
45	1.8000	2.959649	3.94448799
46	1.9000	2.728474	3.83938843
47	2.0000	2.526204	3.74227631
48	2.1000	2.347882	3.65218049
49	2.2000	2.189648	3.56829169
50	2.3000	2.048439	3.48992744

ALUMINUM

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	7.379994	5.30518407
52	1.1000	6.627513	5.30518407
53	1.2000	6.034165	5.30518407
54	1.3000	5.548050	5.30518407
55	1.4000	5.138508	5.30518407
56	1.5000	4.787373	5.30518407
57	1.6000	4.482776	5.30518407
58	1.7000	4.215986	5.30518407
59	1.8000	3.980172	5.30518407
60	1.9000	3.769961	5.30518407
61	2.0000	3.581167	5.30518407
62	2.1000	3.410528	5.30518407
63	2.2000	3.255469	5.30518407
64	2.3000	3.113916	5.30518407
65	2.4000	2.984167	5.30518407
66	2.5000	2.864800	5.30518407
67	2.6000	2.754615	5.30518407
68	2.7000	2.652592	5.30518407
69	2.8000	2.557857	5.30518407
70	2.9000	2.469655	5.30518407
71	3.0000	2.387333	5.30518407

7. 6   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2250	208.829443	29.97089005
2	0.2500	174.182539	28.21882081
3	0.2750	148.099371	26.74089217
4	0.3000	127.897835	25.47294688
5	0.3250	111.882597	24.36991358
6	0.3500	98.936510	23.39912009
7	0.3750	88.297359	22.53624892
8	0.4000	79.429507	21.76278853
9	0.4250	71.946888	21.06437182
10	0.4500	65.565043	20.42965817
11	0.4750	60.070316	19.84956288
12	0.5000	55.299479	19.31671262
13	0.5250	51.125926	18.82505274
14	0.5500	47.450131	18.36955976
15	0.5750	44.192894	17.94602633
16	0.6000	41.290492	17.55089855
17	0.6250	38.691143	17.18115115
18	0.6500	36.352382	16.83419085
19	0.6750	34.239093	16.50778008
20	0.7000	32.322014	16.19997692
21	0.7250	30.576583	15.90908647
22	0.7500	28.982058	15.63362205
23	0.7750	27.520804	15.37227356
24	0.8000	26.177749	15.12388122
25	0.8250	24.939946	14.88741422
26	0.8500	23.796209	14.66195297
27	0.8750	22.736840	14.44667399
28	0.9000	21.753384	14.24083745
29	0.9250	20.838449	14.04377651
30	0.9500	19.985538	13.85488844
31	0.9750	19.188927	13.67362678
32	1.0000	18.443556	13.49949491

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

33	1.0000	18.443556	13.49949491
34	1.0500	17.093864	13.17114127
35	1.1000	15.907578	12.86613834
36	1.1500	14.857376	12.58174551
37	1.2000	13.921341	12.31566572
38	1.2500	13.081925	12.06596363
39	1.3000	12.325047	11.83099341
40	1.3500	11.639340	11.60934186
41	1.4000	11.015536	11.39978433
42	1.4500	10.445983	11.20125115
43	1.5000	9.924268	11.01280129
44	1.6000	9.003805	10.66342151
45	1.7000	8.218520	10.34540415
46	1.8000	7.542000	10.05428457
47	1.9000	6.954018	9.78644788
48	2.0000	6.438948	9.53893363
49	2.1000	5.984595	9.30928946
50	2.2000	5.581321	9.09546173

ALUMINUM

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	18.443556	13.49949491
52	1.1000	16.684903	13.49949491
53	1.2000	15.253175	13.49949491
54	1.3000	14.057741	13.49949491
55	1.4000	13.040270	13.49949491
56	1.5000	12.162300	13.49949491
57	1.6000	11.396745	13.49949491
58	1.7000	10.723240	13.49949491
59	1.8000	10.125908	13.49949491
60	1.9000	9.592236	13.49949491
61	2.0000	9.112327	13.49949491
62	2.1000	8.678299	13.49949491
63	2.2000	8.283796	13.49949491
64	2.3000	7.923620	13.49949491
65	2.4000	7.593467	13.49949491
66	2.5000	7.289728	13.49949491
67	2.6000	7.009353	13.49949491
68	2.7000	6.749748	13.49949491
69	2.8000	6.508685	13.49949491
70	2.9000	6.284248	13.49949491
71	3.0000	6.074773	13.49949491

BERYLLIUM

AC = 5   NC = 5   a = .55

BG	RHOIN	APU	BMU	ESUP0
0.6200	1.8450	1.1734	0.5500	0.1750000

9   HUGONIOT PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	1.0000	0.	0.
2	0.9750	0.030912	0.00020943
3	0.9500	0.065287	0.00088464
4	0.9250	0.103646	0.00210662
5	0.9000	0.146606	0.00397306
6	0.8750	0.194899	0.00660225
7	0.8500	0.249397	0.01013809
8	0.8250	0.311151	0.01475648
9	0.8000	0.381431	0.02007378
10	0.7750	0.461790	0.02815790
11	0.7500	0.554135	0.03754301
12	0.7250	0.660839	0.04924954
13	0.7000	0.784879	0.06381133
14	0.6750	0.930032	0.08191334
15	0.6500	1.101144	0.10444450
16	0.6250	1.304519	0.13257310
17	0.6000	1.548476	0.16785649
18	0.5750	1.844159	0.21240312
19	0.5500	2.206769	0.26911812
20	0.5250	2.657451	0.34208375
21	0.5000	3.226284	0.43716586
22	0.4750	3.957168	0.56301159
23	0.4500	4.916102	0.73275225
24	0.4250	6.205862	0.96703806
25	0.4000	7.993393	1.29973865
26	0.3750	10.564400	1.78936300
27	0.3500	14.441539	2.54390240
28	0.3250	20.670071	3.78111026
29	0.3000	31.623199	5.99898046
30	0.2750	53.872678	10.58473957
31	0.2500	113.698900	23.10953093
32	0.2250	523.042595	109.85311031

BERYLLIUM

10. 1   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.9250	0.103646	0.00210662
2	0.9500	0.065482	0.00097081
3	0.9750	0.031167	0.00032490
4	1.0000	0.000259	0.00011986

BERYLLIUM

9. 1   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8750	0.194899	0.00660225
2	0.9000	0.147366	0.00429631
3	0.9250	0.104782	0.00253937
4	0.9500	0.066560	0.00144851
5	0.9750	0.032190	0.00078843
6	1.0000	0.001228	0.00056991

BERYLLIUM

10. 2   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8250	0.311151	0.01475648
2	0.8500	0.251399	0.01096204
3	0.8750	0.198073	0.00793160
4	0.9000	0.150382	0.00558376
5	0.9250	0.107646	0.00384703
6	0.9500	0.069279	0.00265843
7	0.9750	0.034769	0.00196242
8	1.0000	0.003672	0.00170989

BERYLLIUM

9. 2   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.7250	0.660839	0.04924954
2	0.7500	0.562941	0.04098898
3	0.7750	0.476415	0.03397359
4	0.8000	0.399707	0.02806053
5	0.8250	0.331515	0.02312617
6	0.8500	0.270739	0.01906303
7	0.8750	0.216444	0.01577736
8	0.9000	0.167833	0.01318704
9	0.9250	0.124219	0.01122000
10	0.9500	0.085009	0.00981273
11	0.9750	0.049691	0.00890920
12	1.0000	0.017815	0.00845990

BERYLLIUM

9. 3   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.5750	1.844159	0.21240312
2	0.6000	1.606133	0.18912046
3	0.6250	1.400570	0.16882724
4	0.6500	1.222083	0.15112324
5	0.6750	1.066341	0.13567340
6	0.7000	0.929826	0.12219528
7	0.7250	0.809662	0.11044935
8	0.7500	0.703480	0.10023130
9	0.7750	0.609316	0.09136592
10	0.8000	0.525530	0.08370226
11	0.8250	0.450745	0.07710964
12	0.8500	0.383798	0.07147450
13	0.8750	0.323702	0.06669772
14	0.9000	0.269614	0.06269255
15	0.9250	0.220813	0.05938271
16	0.9500	0.176674	0.05670108
17	0.9750	0.136660	0.05458830
18	1.0000	0.100302	0.05299181
19	1.0250	0.067192	0.05186500
20	1.0500	0.036974	0.05116639
21	1.0750	0.009333	0.05085901

BERYLLIUM

10. 6 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.4750	3.957168	0.56301159
2	0.5000	3.442169	0.51312495
3	0.5250	3.007772	0.46962237
4	0.5500	2.638458	0.43152795
5	0.5750	2.322215	0.39904943
6	0.6000	2.049638	0.36853754
7	0.6250	1.813283	0.34245567
8	0.6500	1.607205	0.31935686
9	0.6750	1.426608	0.29886610
10	0.7000	1 267594	0.28066668
11	0.7250	1.126969	0.26448949
12	0.7500	1.002099	0.25010455
13	0.7750	0.890794	0.23731432
14	0.8000	0.791227	0.22594822
15	0.8250	0.701859	0.21585836
16	0.8500	0.621392	0.20691589
17	0.8750	0.548723	0.19900817
18	0.9000	0.482909	0.19203634
19	0.9250	0.423144	0.18591329
20	0.9500	0.368732	0.18056204
21	0.9750	0.319072	0.17591438
22	1.0000	0.273645	0.17190962

EXPANSION PHASE — ISENTROPE ABOVE ESLIM   BMU =   0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
23	1.0000	0.273645	0.17190962
24	1.0500	0.204325	0.16565149
25	1.1000	0.161676	0.16041772
26	1.1500	0.136782	0.15608887
27	1.2000	0.122618	0.15227964
28	1.2500	0.114360	0.14877065
29	1.3000	0.108950	0.14545340
30	1.3500	0.104629	0.14228588
31	1.4000	0.100525	0.13926008
32	1.4500	0.096313	0.13638089
33	1.5000	0.091961	0.13365407
34	1.6000	0.083039	0.12833069
35	1.7000	0.074954	0.12372454
36	1.8000	0.068049	0.11968800
37	1.9000	0.062250	0.11608585
38	2.0000	0.057336	0.11281830
39	2.1000	0.053097	0.10981824
40	2.2000	0.049382	0.10704125
41	2.3000	0.046088	0.10445657
42	2.4000	0.043145	0.10204138
43	2.5000	0.040500	0.09977746
44	2.6000	0.038112	0.09764963
45	2.7000	0.035947	0.09564489
46	2.8000	0.033977	0.09375193
47	2.9000	0.032178	0.09196085
48	3.0000	0.030531	0.09026293
49	3.1000	0.029019	0.08865047
50	3.2000	0.027625	0.08711661

BERYLLIUM

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	0.273645	0.17190962
52	1.1000	0.174739	0.17190962
53	1.2000	0.142033	0.17190962
54	1.3000	0.131921	0.17190962
55	1.4000	0.125791	0.17190962
56	1.5000	0.118798	0.17190962
57	1.6000	0.111187	0.17190962
58	1.7000	0.103956	0.17190962
59	1.8000	0.097589	0.17190962
60	1.9000	0.092102	0.17190962
61	2.0000	0.087330	0.17190962
62	2.1000	0.083105	0.17190962
63	2.2000	0.079304	0.17190962
64	2.3000	0.075849	0.17190962
65	2.4000	0.072686	0.17190962
66	2.5000	0.069778	0.17190962
67	2.6000	0.067094	0.17190962
68	2.7000	0.064609	0.17190962
69	2.8000	0.062302	0.17190962
70	2.9000	0.060154	0.17190962
71	3.0000	0.058148	0.17190962

BERYLLIUM

9. 4   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.4250	6.205862	0.96703806
2	0.4500	5.374446	0.88902005
3	0.4750	4.683784	0.82122017
4	0.5000	4.104448	0.76195419
5	0.5250	3.614229	0.70988096
6	0.5500	3.196125	0.66392043
7	0.5750	2.836956	0.62319380
8	0.6000	2.526382	0.58697934
9	0.6250	2.256210	0.55467924
10	0.6500	2.019877	0.52579449
11	0.6750	1.812088	0.49990550
12	0.7000	1.628527	0.47665714
13	0.7250	1.465655	0.45574700
14	0.7500	1.320547	0.43691608
15	0.7750	1.190770	0.41994139
16	0.8000	1.074287	0.40462995
17	0.8250	0.969385	0.39081404
18	0.8500	0.874614	0.37834724
19	0.8750	0.788739	0.36710117
20	0.9000	0.710707	0.35696287
21	0.9250	0.639613	0.34783259
22	0.9500	0.574677	0.33962191
23	0.9750	0.515224	0.33225223
24	1.0000	0.460667	0.32565346

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU = 0.

25	1.0000	0.460667	0.32565346
26	1.0500	0.374531	0.31456459
27	1.1000	0.316845	0.30498151
28	1.1500	0.278519	0.29667581
29	1.2000	0.252462	0.28923032
30	1.2500	0.233745	0.28239150
31	1.3000	0.219174	0.27601524
32	1.3500	0.206846	0.27002434
33	1.4000	0.195744	0.26437813
34	1.4500	0.185403	0.25905270
35	1.5000	0.175663	0.25402965
36	1.6000	0.157820	0.24459626
37	1.7000	0.142556	0.23624258
38	1.8000	0.129709	0.22876456
39	1.9000	0.118870	0.22198068
40	2.0000	0.109599	0.21578865
41	2.1000	0.101545	0.21006892
42	2.2000	0.094458	0.20476338
43	2.3000	0.088163	0.19982113
44	2.4000	0.082534	0.19520156
45	2.5000	0.077475	0.19087092
46	2.6000	0.072906	0.18680049
47	2.7000	0.068765	0.18296549
48	2.8000	0.064996	0.17934432
49	2.9000	0.061556	0.17591804
50	3.0000	0.058406	0.17246999

BERYLLIUM

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	0.460667	0.32565346
52	1.1000	0.337938	0.32565346
53	1.2000	0.285548	0.32565346
54	1.3000	0.259753	0.32565346
55	1.4000	0.241380	0.32565346
56	1.5000	0.224823	0.32565346
57	1.6000	0.209591	0.32565346
58	1.7000	0.198092	0.32565346
59	1.8000	0.184393	0.32565346
60	1.9000	0.174230	0.32565346
61	2.0000	0.165350	0.32565346
62	2.1000	0.157400	0.32565346
63	2.2000	0.150219	0.32565346
64	2.3000	0.143680	0.32565346
65	2.4000	0.137691	0.32565346
66	2.5000	0.132183	0.32565346
67	2.6000	0.127099	0.32565346
68	2.7000	0.122391	0.32565346
69	2.8000	0.118020	0.32565346
70	2.9000	0.113951	0.32565346
71	3.0000	0.110152	0.32565346

BERYLLIUM

9. 5   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2750	53.872678	10.58473957
2	0.3000	45.479070	9.91805792
3	0.3250	38.953511	9.35054135
4	0.3500	33.787418	8.86099672
5	0.3750	29.613585	8.43392038
6	0.4000	26.193010	8.05770576
7	0.4250	23.352301	7.72348809
8	0.4500	20.965473	7.42437720
9	0.4750	18.939179	7.15493417
10	0.5000	17.203046	6.91080642
11	0.5250	15.703189	6.68846774
12	0.5500	14.397772	6.48502970
13	0.5750	13.253901	6.29810262
14	0.6000	12.245419	6.12569153
15	0.6250	11.351305	5.96611726
16	0.6500	10.554505	5.81795549
17	0.6750	9.841065	5.67999005
18	0.7000	9.199471	5.55117553
19	0.7250	8.620154	5.43060815
20	0.7500	8.095104	5.31750232
21	0.7750	7.617575	5.21117163
22	0.8000	7.181852	5.11101353
23	0.8250	6.783063	5.01649672
24	0.8500	6.417037	4.92715073
25	0.8750	6.080182	4.84255749
26	0.9000	5.769392	4.7623440
27	0.9250	5.481971	4.68617654
28	0.9500	5.215566	4.61375511
29	0.9750	4.968118	4.54480970
30	1.0000	4.737818	4.47909635

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
31	1.0000	4.737818	4.47909635
32	1.0500	4.332182	4.35664272
33	1.1000	3.992000	4.24411362
34	1.1500	3.702511	4.14004529
35	1.2000	3.452239	4.04323810
36	1.2500	3.232580	3.95276150
37	1.3000	3.037238	3.86788353
38	1.3500	2.861681	3.78801566
39	1.4000	2.702647	3.71267202
40	1.4500	2.557759	3.64144087
41	1.5000	2.425221	3.57396528
42	1.6000	2.191858	3.44921628
43	1.7000	1.993556	3.33610699
44	1.8000	1.823550	3.23292783
45	1.9000	1.676491	3.13829654
46	2.0000	1.548187	3.05109036
47	2.1000	1.435378	2.97038817
48	2.2000	1.335527	2.89542490
49	2.3000	1.246627	2.82555738
50	2.4000	1.167065	2.76023945

BERYLLIUM

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	4.737818	4.47909635
52	1.1000	4.209011	4.47909635
53	1.2000	3.821074	4.47909635
54	1.3000	3.514539	4.47909635
55	1.4000	3.258297	4.47909635
56	1.5000	3.037614	4.47909635
57	1.6000	2.845063	4.47909635
58	1.7000	2.675835	4.47909635
59	1.8000	2.526084	4.47909635
60	1.9000	2.392586	4.47909635
61	2.0000	2.272722	4.47909635
62	2.1000	2.164408	4.47909635
63	2.2000	2.065996	4.47909635
64	2.3000	1.976161	4.47909635
65	2.4000	1.893819	4.47909635
66	2.5000	1.818065	4.47909635
67	2.6000	1.748140	4.47909635
68	2.7000	1.683394	4.47909635
69	2.8000	1.623273	4.47909635
70	2.9000	1.567298	4.47909635
71	3.0000	1.515054	4.47909635

BERYLLIUM

9. 6   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2500	113.698900	23.10953093
2	0.2750	95.706842	21.70524836
3	0.3000	81.886540	20.51204300
4	0.3250	71.016694	19.41326397
5	0.3500	62.295956	18.50531713
6	0.3750	55.180191	17.79336238
7	0.4000	49.288964	17.08861279
8	0.4250	44.349504	16.45657825
9	0.4500	40.161889	15.88589084
10	0.4750	36.576739	15.36749649
11	0.5000	33.480520	14.89408779
12	0.5250	30.785611	14.45969641
13	0.5500	28.423467	14.05939579
14	0.5750	26.339803	13.68907976
15	0.6000	24.491140	13.34529626
16	0.6250	22.842306	13.02511978
17	0.6500	21.364577	12.72605336
18	0.6750	20.034301	12.44595146
19	0.7000	18.831845	12.18295920
20	0.7250	17.740797	11.93546379
21	0.7500	16.747343	11.70205581
22	0.7750	15.839784	11.48149741
23	0.8000	15.008157	11.27269661
24	0.8250	14.243428	11.07468605
25	0.8500	13.539752	10.88660514
26	0.8750	12.889278	10.70768583
27	0.9000	12.286987	10.53723979
28	0.9250	11.728066	10.37464869
29	0.9500	11.208301	10.21935487
30	0.9750	10.723985	10.07085419
31	1.0000	10.271853	9.92868960

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

32	1.0000	10.271853	9.92868960
33	1.0500	9.462677	9.66200387
34	1.1000	8.765185	9.41553319
35	1.1500	8.157555	9.18663990
36	1.2000	7.622593	8.97314632
37	1.2500	7.147000	8.77328360
38	1.3000	6.720599	8.58559680
39	1.3500	6.335615	8.40887034
40	1.4000	5.986071	8.24207151
41	1.4500	5.667291	8.08430922
42	1.5000	5.375525	7.93480450
43	1.6000	4.861416	7.65828806
44	1.7000	4.423788	7.40739262
45	1.8000	4.047828	7.17841053
46	1.9000	3.722040	6.96833819
47	2.0000	3.437465	6.77472138
48	2.1000	3.187101	6.59553397
49	2.2000	2.965428	6.42908520
50	2.3000	2.768043	6.27394980

BERYLLIUM

EXPANSION PHASE — ISOENERGY ABOVE ESLIM

51	1.0000	10.271853	9.92868760
52	1.1000	9.238682	9.92868960
53	1.2000	8.430744	9.92868960
54	1.3000	7.769079	9.92868960
55	1.4000	7.208628	9.92868960
56	1.5000	6.724421	9.92868960
57	1.6000	6.301363	9.92868960
58	1.7000	5.928787	9.92868960
59	1.8000	5.598301	9.92868960
60	1.9000	5.303102	9.92868960
61	2.0000	5.037710	9.92868960
62	2.1000	4.797729	9.92868960
63	2.2000	4.579621	9.92868960
64	2.3000	4.380498	9.92868960
65	2.4000	4.197975	9.92868960
66	2.5000	4.030055	9.92868960
67	2.6000	3.875053	9.92868960
68	2.7000	3.731533	9.92868960
69	2.8000	3.598264	9.92868960
70	2.9000	3.474185	9.92868960
71	3.0000	3.358379	9.92868960

TITANIUM

AC = 5   WC = 5

& = .5

BG 0.6000	RHOIN 4.5100	AMU 1.0300	BMU 0.5000	ESUB0 0.0700000

11   HUGONIOT PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	1.0000	0.	0.
2	0.9750	0.027121	0.00007517
3	0.9500	0.057249	0.00031734
4	0.9250	0.090831	0.00075524
5	0.9000	0.128394	0.00142343
6	0.8750	0.170564	0.00236369
7	0.8500	0.218086	0.00362670
8	0.8250	0.271855	0.00527434
9	0.8000	0.332952	0.00738252
10	0.7750	0.402694	0.01004502
11	0.7500	0.482698	0.01337854
12	0.7250	0.574968	0.01752950
13	0.7000	0.682009	0.02268323
14	0.6750	0.806991	0.02907672
15	0.6500	0.953964	0.03701632
16	0.6250	1.128171	0.04690290
17	0.6000	1.336495	0.05926806
18	0.5750	1.588102	0.07482742
19	0.5500	1.895410	0.09456037
20	0.5250	2.275556	0.11983248
21	0.5000	2.752689	0.15258809
22	0.4750	3.361667	0.19566242
23	0.4500	4.154194	0.25330451
24	0.4250	5.209458	0.33208846
25	0.4000	6.653407	0.44257690
26	0.3750	8.695752	0.60253263
27	0.3500	11.706186	0.84357209
28	0.3250	16.386375	1.22625302
29	0.3000	24.209015	1.87874825
30	0.2750	38.756168	3.11510196
31	0.2500	71.130749	5.91441882
32	0.2250	178.062588	15.89916811
33	0.2000	96515.000000	031.62500000

TITANIUM

12. :   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.9250	0.090831	0.00075524
2	0.9500	0.057409	0.00034802
3	0.9750	0.027331	0.00011638
4	1.0000	0.000213	0.00004290

TITANIUM

11. 1   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8750	0.170564	0.00236369
2	0.9000	0.129015	0.00153805
3	0.9250	0.091759	0.00093028
4	0.9500	0.058291	0.00051805
5	0.9750	0.028169	0.00028164
6	1.0000	0.001009	0.00020363

TITANIUM

12. 2   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8250	0.271855	0.00527434
2	0.8500	0.219718	0.00391800
3	0.8750	0.173154	0.00283445
4	0.9000	0.131478	0.00199483
5	0.9250	0.094102	0.00137375
6	0.9500	0.060518	0.00094885
7	0.9750	0.030285	0.00070042
8	1.0000	0.003017	0.00061099

TITANIUM

11. 2 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.7250	0.574968	0.01752950
2	0.7500	0.489868	0.01458921
3	0.7750	0.414611	0.01209184
4	0.8000	0.347854	0.00990678
5	0.8250	0.288474	0.00823024
6	0.8500	0.235518	0.00678414
7	0.8750	0.188179	0.00561524
8	0.9000	0.145767	0.00469445
9	0.9250	0.107689	0.00399616
10	0.9500	0.073432	0.00349788
11	0.9750	0.042553	0.00317971
12	1.0000	0.014663	0.00302404

TITANIUM

12. 4 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.6250	1.128171	0.04690290
2	0.6500	0.979169	0.04108436
3	0.6750	0.849239	0.03603540
4	0.7000	0.735436	0.03165908
5	0.7250	0.635352	0.02787324
6	0.7500	0.547003	0.02460772
7	0.7750	0.468742	0.02180237
8	0.8000	0.399197	0.01940534
9	0.8250	0.337211	0.01737174
10	0.8500	0.281811	0.01566254
11	0.8750	0.232167	0.01424367
12	0.9000	0.187573	0.01302531
13	0.9250	0.147420	0.01216123
14	0.9500	0.111186	0.01144837
15	0.9750	0.078416	0.01092631
16	1.0000	0.048716	0.01057701
17	1.0250	0.021740	0.01038446

TITANIUM

11. 3 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.5750	1.588102	0.07482742
2	0.6000	1.381088	0.06662560
3	0.6250	1.205936	0.05947736
4	0.6500	1.052040	0.05324214
5	0.6750	0.917691	0.04780219
6	0.7000	0.799875	0.04305818
7	0.7250	0.696127	0.03892583
8	0.7500	0.604415	0.03533322
9	0.7750	0.523053	0.03221864
10	0.8000	0.450633	0.02952889
11	0.8250	0.385971	0.02721791
12	0.8500	0.328068	0.02524565
13	0.8750	0.276075	0.02357713
14	0.9000	0.229266	0.02218174
15	0.9250	0.187020	0.02103256
16	0.9500	0.148801	0.02010586
17	0.9750	0.114145	0.01938069
18	1.0000	0.082648	0.01883847
19	1.0250	0.053959	0.01846270
20	1.0500	0.027771	0.01823874
21	1.0750	0.003813	0.01815348

12. 6   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.4500	4.154194	0.25330451
2	0.4750	3.606205	0.23190869
3	0.5000	3.147097	0.21328105
4	0.5250	2.759098	0.19698368
5	0.5500	2.428609	0.18266416
6	0.5750	2.145087	0.17003588
7	0.6000	1.900266	0.15886365
8	0.6250	1.687596	0.14895279
9	0.6500	1.501836	0.14014090
10	0.6750	1.338755	0.13229155
11	0.7000	1.194908	0.12528937
12	0.7250	1.067471	0.11903617
13	0.7500	0.954110	0.11344797
14	0.7750	0.852885	0.10845251
15	0.8000	0.762174	0.10398735
16	0.8250	0.680611	0.09999824
17	0.8500	0.607042	0.09643789
18	0.8750	0.540434	0.09326489
19	0.9000	0.480100	0.09044285
20	0.9250	0.425169	0.08793966
21	0.9500	0.375073	0.08572692
22	0.9750	0.329274	0.08377939
23	1.0000	0.287308	0.08207461

EXPANSION PHASE — ISENTROPE ABOVE ESLIM   BMU = 0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
24	1.0000	0.287308	0.08207461
25	1.0500	0.222399	0.07932813
26	1.1000	0.180441	0.07672452
27	1.1500	0.154471	0.07451229
28	1.2000	0.138362	0.07254696
29	1.2500	0.127889	0.07074558
30	1.3000	0.120352	0.06906681
31	1.3500	0.114183	0.06749386
32	1.4000	0.108575	0.06602165
33	1.4500	0.103199	0.06464847
34	1.5000	0.097980	0.06337176
35	1.6000	0.087719	0.06075491
36	1.7000	0.078989	0.05860605
37	1.8000	0.071761	0.05678891
38	1.9000	0.065774	0.05519873
39	2.0000	0.060723	0.05377024
40	2.1000	0.056367	0.05246335
41	2.2000	0.052545	0.05125400
42	2.3000	0.049149	0.05012705
43	2.4000	0.046108	0.04907210
44	2.5000	0.043369	0.04808128
45	2.6000	0.040892	0.04714820
46	2.7000	0.038642	0.04626740
47	2.8000	0.036591	0.04543418
48	2.9000	0.034715	0.04464439
49	3.0000	0.032994	0.04389440
50	3.1000	0.031411	0.04318096

TITANIUM

EXPANSION PHASE — ISOENERGY ABOVE ESLIM

51	1.0000	0.287308	0.08207461
52	1.1000	0.193634	0.08207461
53	1.2000	0.158091	0.08207461
54	1.3000	0.145087	0.08207461
55	1.4000	0.135916	0.08207461
56	1.5000	0.126971	0.08207461
57	1.6000	0.118229	0.08207461
58	1.7000	0.110333	0.08207461
59	1.8000	0.103528	0.08207461
60	1.9000	0.097704	0.08207461
61	2.0000	0.092647	0.08207461
62	2.1000	0.088168	0.08207461
63	2.2000	0.084137	0.08207461
64	2.3000	0.080471	0.08207461
65	2.4000	0.077117	0.08207461
66	2.5000	0.074031	0.08207461
67	2.6000	0.071184	0.08207461
68	2.7000	0.068548	0.08207461
69	2.8000	0.066099	0.08207461
70	2.9000	0.063820	0.08207461
71	3.0000	0.061693	0.08207461

TITANIUM

11. 4   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.4250	5.209458	0.33208846
2	0.4500	4.510571	0.30530063
3	0.4750	3.929722	0.28202721
4	0.5000	3.442292	0.26169028
5	0.5250	3.029688	0.24382935
6	0.5500	2.677667	0.22807337
7	0.5750	2.375179	0.21412026
8	0.6000	2.113553	0.20172186
9	0.6250	1.885911	0.19067249
10	0.6500	1.686744	0.18080044
11	0.6750	1.511602	0.17196123
12	0.7000	1.356859	0.16403259
13	0.7250	1.219540	0.15691033
14	0.7500	1.097184	0.15050524
15	0.7750	0.987745	0.14474044
16	0.8000	0.889509	0.13954945
17	0.8250	0.801032	0.13487443
18	0.8500	0.721095	0.13066490
19	0.8750	0.648657	0.12687660
20	0.9000	0.582831	0.12347057
21	0.9250	0.522854	0.12041240
22	0.9500	0.468070	0.11767160
23	0.9750	0.417909	0.11522107
24	1.0000	0.371876	0.11303662

EXPANSION PHASE — ISENTROPE ABOVE ESLIM   BMU = 0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
25	1.0000	0.371876	0.11303662
26	1.0500	0.299467	0.10939591
27	1.1000	0.250908	0.10602345
28	1.1500	0.219010	0.10310612
29	1.2000	0.197633	0.10049620
30	1.2500	0.182513	0.09810562
31	1.3000	0.170899	0.09588623
32	1.3500	0.161159	0.09381364
33	1.4000	0.152425	0.09187555
34	1.4500	0.144306	0.09006415
35	1.5000	0.136672	0.08837222
36	1.6000	0.122491	0.08506230
37	1.7000	0.110555	0.08224085
38	1.8000	0.100650	0.07978261
39	1.9000	0.092379	0.07759123
40	2.0000	0.085347	0.07560129
41	2.1000	0.079250	0.07377081
42	2.2000	0.073885	0.07207276
43	2.3000	0.069112	0.07048884
44	2.4000	0.064837	0.06900559
45	2.5000	0.060986	0.06761235
46	2.6000	0.057503	0.06630025
47	2.7000	0.054339	0.06506167
48	2.8000	0.051454	0.06388998
49	2.9000	0.048816	0.06277938
50	3.0000	0.046396	0.06172473

TITANIUM

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	0.371876	0.11303662
52	1.1000	0.267247	0.11303662
53	1.2000	0.223468	0.11303662
54	1.3000	0.202490	0.11303662
55	1.4000	0.187744	0.11303662
56	1.5000	0.174467	0.11303662
57	1.6000	0.162288	0.11303662
58	1.7000	0.151574	0.11303662
59	1.8000	0.142379	0.11303662
60	1.9000	0.134473	0.11303662
61	2.0000	0.127564	0.11303662
62	2.1000	0.121417	0.11303662
63	2.2000	0.115873	0.11303662
64	2.3000	0.110828	0.11303662
65	2.4000	0.106208	0.11303662
66	2.5000	0.101959	0.11303662
67	2.6000	0.098038	0.11303662
68	2.7000	0.094407	0.11303662
69	2.8000	0.091035	0.11303662
70	2.9000	0.087896	0.11303662
71	3.0000	0.084966	0.11303662

TITANIUM

11. 5   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2750	38.756168	3.11510155
2	0.3000	32.608524	2.9192903J
3	0.3250	27.845936	2.75313663
4	0.3500	24.079235	2.61023962
5	0.3750	21.046962	2.48592588
6	0.4000	18.568236	2.37670404
7	0.4250	16.514719	2.27991310
8	0.4500	14.793312	2.19348922
9	0.4750	13.335153	2.11380667
10	0.5000	12.088416	2.04556713
11	0.5250	11.013487	1.98372091
12	0.5500	10.079665	1.92340991
13	0.5750	9.262855	1.86992554
14	0.6000	8.543926	1.82067738
15	0.6250	7.907534	1.77516934
16	0.6500	7.341250	1.73298140
17	0.6750	6.834921	1.69375546
18	0.7000	6.380183	1.65718427
19	0.7250	5.970095	1.62300259
20	0.7500	5.598859	1.59098019
21	0.7750	5.261597	1.56091620
22	0.8000	4.954181	1.53263456
23	0.8250	4.673100	1.50598019
24	0.8500	4.415351	1.48081601
25	0.8750	4.178350	1.45702027
26	0.9000	3.959869	1.43448453
27	0.9250	3.757972	1.41311181
28	0.9500	3.570975	1.39281511
29	0.9750	3.397404	1.37351617
30	1.0000	3.235967	1.35514434

EXPANSION PHASE — ISENTROPE ABOVE ESLIM   BMU =   0.

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
31	1.0000	3.235967	1.35514434
32	1.0500	2.953411	1.32097453
33	1.1000	2.719156	1.28956990
34	1.1500	2.521850	1.26053716
35	1.2000	2.352634	1.23352246
36	1.2500	2.204932	1.20825641
37	1.3000	2.074006	1.18453112
38	1.3500	1.956516	1.16218217
39	1.4000	1.850127	1.14207542
40	1.4500	1.753183	1.12109797
41	1.5000	1.664466	1.10215212
42	1.6000	1.508139	1.06704338
43	1.7000	1.375232	1.03514285
44	1.8000	1.261219	1.00597653
45	1.9000	1.162488	0.97916228
46	2.0000	1.076210	0.95439165
47	2.1000	1.000203	0.93141313
48	2.2000	0.932781	0.91001858
49	2.3000	0.872623	0.89003328
50	2.4000	0.818668	0.87130883

TITANIUM

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	3.235967	1.35514434
52	1.1000	2.853853	1.35514434
53	1.2000	2.581477	1.35514434
54	1.3000	2.370181	1.35514434
55	1.4000	2.195076	1.35514434
56	1.5000	2.044878	1.35514434
57	1.6000	1.914221	1.35514434
58	1.7000	1.799723	1.35514434
59	1.8000	1.698656	1.35514434
6.	1.9000	1.608722	1.35514434
61	2.0000	1.528059	1.35514434
62	2.1000	1.455209	1.35514434
63	2.2000	1.389035	1.35514434
64	2.3000	1.328634	1.35514434
65	2.4000	1.273272	1.35514434
66	2.5000	1.222340	1.35514434
67	2.6000	1.175327	1.35514434
68	2.7000	1.131796	1.35514434
69	2.8000	1.091375	1.35514434
70	2.9000	1.053742	1.35514434
71	3.0000	1.018617	1.35514434

TITANIUM

11. 6   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2250	178.062588	15.29916811
2	0.2500	148.760983	14.40305497
3	0.2750	126.630891	13.64764130
4	0.3000	109.448569	12.99825764
5	0.3250	95.800249	12.43295038
6	0.3500	84.750072	11.93517649
7	0.3750	75.657187	11.49259400
8	0.4000	68.069917	11.09578919
9	0.4250	61.661915	10.73744392
10	0.4500	56.192237	10.41177380
11	0.4750	51.479604	10.11413968
12	0.5000	47.385314	9.84077227
13	0.5250	43.801653	9.58857393
14	0.5500	40.643851	9.35497248
15	0.5750	37.844383	9.13781202
16	0.6000	35.348878	8.93527043
17	0.6250	33.113114	8.74579573
18	0.6500	31.100807	8.56805706
19	0.6750	29.281928	8.40090537
20	0.7000	27.631442	8.24334300
21	0.7250	26.128327	8.09449899
22	0.7500	24.754817	7.95360911
23	0.7750	23.495806	7.81999952
24	0.8000	22.338375	7.69307369
25	0.8250	21.271421	7.57230115
26	0.8500	20.285353	7.45720863
27	0.8750	19.371848	7.34737211
28	0.9000	18.523650	7.24241060
29	0.9250	17.734411	7.14198065
30	0.9500	16.998557	7.04577172
31	0.9750	16.311167	6.95350218
32	1.0000	15.667894	6.86491609

EXPANSION PHASE — ISENTROPE ABOVE ESLIM   BMU =   0.

33	1.0000	15.667894	6.86491609
34	1.0500	14.507174	6.69803160
35	1.1000	13.493528	6.54310489
36	1.1500	12.600675	6.39869308
37	1.2000	11.807671	6.26358467
38	1.2500	11.098000	6.13677365
39	1.3000	10.458683	6.01741564
40	1.3500	9.879498	5.90479296
41	1.4000	9.352318	5.79828823
42	1.4500	8.870586	5.69736427
43	1.5000	8.428912	5.60154921
44	1.6000	7.648698	5.42387259
45	1.7000	6.982262	5.26212603
46	1.8000	6.407749	5.11405301
47	1.9000	5.908272	4.97782028
48	2.0000	5.470680	4.85192376
49	2.1000	5.084656	4.73511660
50	2.2000	4.742025	4.62635434

TITANIUM

EXPANSION PHASE — ISOENERGY ABOVE ESLIM

51	1.0000	15.667894	6.86491609
52	1.1000	14.153296	6.86491609
53	1.2000	12.937733	6.86491609
54	1.3000	11.928816	6.86491609
55	1.4000	11.070380	6.86491609
56	1.5000	10.328190	6.86491609
57	1.6000	9.679676	6.86491609
58	1.7000	9.108319	6.86491609
59	1.8000	8.601192	6.86491609
60	1.9000	8.147957	6.86491609
61	2.0000	7.740329	6.86491609
62	2.1000	7.371655	6.86491609
63	2.2000	7.036551	6.86491609
64	2.3000	6.730606	6.86491609
65	2.4000	6.450162	6.86491609
66	2.5000	6.192155	6.86491609
67	2.6000	5.953995	6.86491609
68	2.7000	5.733476	6.86491609
69	2.8000	5.528709	6.86491609
70	2.9000	5.338064	6.86491609
71	3.0000	5.160129	6.86491609

NICKEL

AC = 5   HC = 5

a = .5

BG	RHOIN	AMU	BMU	ESUB0
1.3300	8.8500	1.9120	1.5000	0.0900000

13   HUGONIOT PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	1.0000	0.	0.
2	0.9750	0.051212	0.00007225
3	0.9500	0.110076	0.00031059
4	0.9250	0.178028	0.00075350
5	0.9000	0.256830	0.00144938
6	0.8750	0.348650	0.00245943
7	0.8500	0.456174	0.00386151
8	0.8250	0.582746	0.00575510
9	0.8000	0.732560	0.00626817
10	0.7750	0.910902	0.01156619
11	0.7500	1.124481	0.01586457
12	0.7250	1.381859	0.02144533
13	0.7000	1.694037	0.02868008
14	0.6750	2.075238	0.03806164
15	0.6500	2.543985	0.05024800
16	0.6250	3.124583	0.06612407
17	0.6000	3.849226	0.08688998
18	0.5750	4.761031	0.11418951
19	0.5500	5.918527	0.15050120
20	0.5250	7.402496	0.19843031
21	0.5000	9.326645	0.26316716
22	0.4750	11.854806	0.35122871
23	0.4500	15.229532	0.47269989
24	0.4250	19.821493	0.64319175
25	0.4000	26.218832	0.88777079
26	0.3750	35.398192	1.24852534
27	0.3500	49.076126	1.80019638
28	0.3250	70.500647	2.68554929
29	0.3000	106.469111	4.20589012
30	0.2750	173.473684	7.09754026
31	0.2500	322.536228	13.65136313
32	0.2250	814.034050	35.60250235
33	0.2000	94282.000000	968.00000000

NICKEL

13. 1   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8750	0.348650	0.00245943
2	0.9000	0.259613	0.00160698
3	0.9250	0.182102	0.00098874
4	0.9500	0.114551	0.00057452
5	0.9750	0.055621	0.00033820
6	1.0000	0.004181	0.00025714

NICKEL

13. 2   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.7250	1.381859	0.02144533
2	0.7500	1.162135	0.01787117
3	0.7750	0.972259	0.01487260
4	0.8000	0.807762	0.01237211
5	0.8250	0.664929	0.01030365
6	0.8500	0.540657	0.00861073
7	0.8750	0.432339	0.00724488
8	0.9000	0.337773	0.00616433
9	0.9250	0.255090	0.00533307
10	0.9500	0.182697	0.00471994
11	0.9750	0.119228	0.00429791
12	1.0000	0.063513	0.00404354
13	1.0250	0.014538	0.00393645

NICKEL

15. 3   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.5750	4.761031	0.11418951
2	0.6000	4.112439	0.10172516
3	0.6250	3.561200	0.09094364
4	0.6500	3.090123	0.08159658
5	0.6750	2.685528	0.07347871
6	0.7000	2.336434	0.06641915
7	0.7250	2.033957	0.06027478
8	0.7500	1.770856	0.05492503
9	0.7750	1.541186	0.05026779
10	0.8000	1.340036	0.04621612
11	0.8250	1.163323	0.04269567
12	0.8500	1.007634	0.03964263
13	0.8750	0.870101	0.03700197
14	0.9000	0.748300	0.03472607
15	0.9250	0.640175	0.03277362
16	0.9500	0.543972	0.03110864
17	0.9750	0.458190	0.02969971
18	1.0000	0.381539	0.02851936

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

19	1.0000	0.381539	0.02851936
20	1.0500	0.266270	0.02676275
21	1.1000	0.190635	0.02495595
22	1.1500	0.145410	0.02352333
23	1.2000	0.118613	0.02231607
24	1.2500	0.102207	0.02124851
25	1.3000	0.091230	0.02028155
26	1.3500	0.082896	0.01940507
27	1.4000	0.075811	0.01862156
28	1.4500	0.069386	0.01793397
29	1.5000	0.063448	0.01733997
30	1.6000	0.050137	0.01550791
31	1.7000	0.041695	0.01451512
32	1.8000	0.036010	0.01388549
33	1.9000	0.032064	0.01342309
34	2.0000	0.029181	0.01304597
35	2.1000	0.026922	0.01271740
36	2.2000	0.025037	0.01242012
37	2.3000	0.023401	0.01214566
38	2.4000	0.021948	0.01188964
39	2.5000	0.020643	0.01164947
40	2.6000	0.019464	0.01142336
41	2.7000	0.018393	0.01120995
42	2.8000	0.017416	0.01100807
43	2.9000	0.016523	0.01081672
44	3.0000	0.015704	0.01063500
45	3.1000	0.014951	0.01046215
46	3.2000	0.014256	0.01029745
47	3.3000	0.013613	0.01014030
48	3.4000	0.013017	0.00999013
49	3.5000	0.012463	0.00984643
50	3.6000	0.011947	0.00970875

NICKEL

EXPANSION PHASE — ISOENERGY ABOVE ESLIM

51	1.0000	0.381539	0.02851936
52	1.1000	0.224640	0.02851936
53	1.2000	0.166749	0.02851936
54	1.3000	0.141757	0.02851936
55	1.4000	0.123559	0.02851936
56	1.5000	0.106711	0.02851936
57	1.6000	0.092231	0.02851936
58	1.7000	0.081171	0.02851936
59	1.8000	0.073310	0.02851936
60	1.9000	0.067757	0.02851936
61	2.0000	0.063626	0.02851936
62	2.1000	0.060310	0.02851936
63	2.2000	0.057471	0.02851936
64	2.3000	0.054942	0.02851936
65	2.4000	0.052645	0.02851936
66	2.5000	0.050537	0.02851936
67	2.6000	0.048593	0.02851936
68	2.7000	0.046793	0.02851936
69	2.8000	0.045122	0.02851936
70	2.9000	0.043566	0.02851936
71	3.0000	0.042114	0.02851936

NICKEL

13. 4   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.4250	19.821493	0.64319175
2	0.4500	17.045881	0.59150387
3	0.4750	14.768014	0.54687309
4	0.5000	12.879231	0.50806704
5	0.5250	11.298464	0.47411552
6	0.5500	9.964338	0.44424558
7	0.5750	8.829760	0.41783473
8	0.6000	7.858154	0.39437670
9	0.6250	7.020799	0.37345608
10	0.6500	6.294912	0.35472917
11	0.6750	5.662251	0.33790948
12	0.7000	5.108085	0.32275652
13	0.7250	4.620421	0.30906713
14	0.7500	4.189429	0.29666863
15	0.7750	3.806989	0.28541344
16	0.8000	3.466356	0.27517481
17	0.8250	3.161892	0.26584330
18	0.8500	2.888857	0.25732400
19	0.8750	2.643247	0.24953428
20	0.9000	2.421660	0.24240185
21	0.9250	2.221196	0.23586330
22	0.9500	2.039368	0.22986275
23	0.9750	1.874037	0.22435082
24	1.0000	1.723356	0.21928371

EXPANSION PHASE — ISENTROPE ABOVE ESLIM   BMU = 0.

25	1.0000	1.723356	0.21928371
26	1.0500	1.469295	0.21035824
27	1.1000	1.268896	0.20235891
28	1.1500	1.109512	0.19537780
29	1.2000	0.980300	0.18922464
30	1.2500	0.873546	0.18375929
31	1.3000	0.783961	0.17887560
32	1.3500	0.707988	0.17448955
33	1.4000	0.643212	0.17053137
34	1.4500	0.587904	0.16694093
35	1.5000	0.540718	0.16366547
36	1.6000	0.465851	0.15774375
37	1.7000	0.411261	0.15267032
38	1.8000	0.370353	0.14820350
39	1.9000	0.338296	0.14418330
40	2.0000	0.311953	0.14050876
41	2.1000	0.289475	0.13711622
42	2.2000	0.269817	0.13396358
43	2.3000	0.252373	0.13102064
44	2.4000	0.236758	0.12826399
45	2.5000	0.222696	0.12567440
46	2.6000	0.209975	0.12323555
47	2.7000	0.198420	0.12093335
48	2.8000	0.187888	0.11875548
49	2.9000	0.178256	0.11669115
50	3.0000	0.169419	0.11473082

NICKEL

EXPANSION PHASE · ISOENERGY ABOVE ESLIM

51	1.0000	1.723356	0.21928371
52	1.1000	1.348798	0.21928371
53	1.2000	1.104577	0.21928371
54	1.3000	0.932124	0.21928371
55	1.4000	0.804251	0.21928371
56	1.5000	0.708770	0.21928371
57	1.6000	0.638127	0.21928371
58	1.7000	0.585667	0.21928371
59	1.8000	0.545626	0.21928371
60	1.9000	0.513521	0.21928371
61	2.0000	0.486480	0.21928371
62	2.1000	0.462822	0.21928371
63	2.2000	0.441624	0.21928371
64	2.3000	0.422376	0.21928371
65	2.4000	0.404765	0.21928371
66	2.5000	0.388572	0.21928371
67	2.6000	0.373626	0.21928371
68	2.7000	0.359788	0.21928371
69	2.8000	0.346938	0.21928371
70	2.9000	0.334975	0.21928371
71	3.0000	0.323809	0.21928371

NICKEL

14. 6   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.3000	106.469111	4.20589012
2	0.3250	89.433648	3.93228301
3	0.3500	76.201394	3.70058402
4	0.3750	65.724705	3.50180271
5	0.4000	57.291277	3.32933438
6	0.4250	50.403743	3.17822301
7	0.4500	44.706639	3.04468012
8	0.4750	39.940670	2.92576185
9	0.5000	35.913226	2.81914711
10	0.5250	32.478888	2.72298184
11	0.5500	29.526358	2.63576752
12	0.5750	26.968866	2.55628014
13	0.6000	24.738782	2.48351020
14	0.6250	22.782058	2.41661772
15	0.6500	21.055418	2.35489815
16	0.6750	19.523827	2.29775617
17	0.7000	18.158681	2.24468526
18	0.7250	16.936441	2.19525173
19	0.7500	15.837597	2.14908206
20	0.7750	14.845865	2.10585281
21	0.8000	13.947573	2.06528246
22	0.8250	13.131169	2.02712485
23	0.8500	12.386841	1.99116372
24	0.8750	11.706209	1.95720828
25	0.9000	11.082086	1.92508961
26	0.9250	10.508274	1.89465757
27	0.9500	9.979409	1.86577821
28	0.9750	9.490826	1.83833168
29	1.0000	9.038456	1.81221040

EXPANSION PHASE – ISENTROPE ABOVE ESLIM   HMU =   0.

30	1.0000	9.038456	1.81221040
31	1.0500	8.235545	1.76363069
32	1.1000	7.549853	1.71918565
33	1.1500	6.958747	1.67831796
34	1.2000	6.444434	1.64055103
35	1.2500	5.993228	1.60549577
36	1.3000	5.594662	1.57282989
37	1.3500	5.240660	1.54228218
38	1.4000	4.924860	1.51362108
39	1.4500	4.642089	1.48664676
40	1.5000	4.388011	1.46118568
41	1.6000	3.951691	1.41429526
42	1.7000	3.591085	1.37186642
43	1.8000	3.287672	1.33315592
44	1.9000	3.027927	1.29760101
45	2.0000	2.802296	1.26476845
46	2.1000	2.604074	1.23431540
47	2.2000	2.428442	1.20596276
48	2.3000	2.271795	1.17947802
49	2.4000	2.131322	1.15466422
50	2.5000	2.004758	1.13135268

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EXPANSION PHASE — ISOENERGY ABOVE ESLIM

51	1.0000	9.038456	1.81221040
52	1.1000	7.926039	1.81221040
53	1.2000	7.079831	1.81221040
54	1.3000	6.411690	1.81221040
55	1.4000	5.870503	1.81221040
56	1.5000	5.425158	1.81221040
57	1.6000	5.053642	1.81221040
58	1.7000	4.738669	1.81221040
59	1.8000	4.466717	1.81221040
60	1.9000	4.227794	1.31221040
61	2.0000	4.014885	1.81221040
62	2.1000	3.823158	1.81221040
63	2.2000	3.649204	1.81221040
64	2.3000	3.490493	1.81221040
65	2.4000	3.345043	1.81221040
66	2.5000	3.211238	1.81221040
67	2.6000	3.087728	1.81221040
68	2.7000	2.973367	1.81221040
69	2.8000	2.867176	1.81221040
70	2.9000	2.768308	1.81221040
71	3.0000	2.676031	1.81221040

NICKEL

13. 5   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2750	173.473686	7.09754026
2	0.3000	145.019682	6.65314859
3	0.3250	123.219913	6.27815592
4	0.3500	106.143284	5.95703703
5	0.3750	92.510399	5.67859012
6	0.4000	81.447115	5.43453354
7	0.4250	72.340075	5.21861392
8	0.4500	64.748779	5.02602118
9	0.4750	58.350338	4.85249468
10	0.5000	52.903732	4.69655114
11	0.5250	48.226117	4.55429327
12	0.5500	44.176745	4.42427200
13	0.5750	40.645838	4.30488592
14	0.6000	37.546742	4.19480669
15	0.6250	34.810313	4.09292287
16	0.6500	32.380822	3.99829689
17	0.6750	30.212943	3.91013223
18	0.7000	28.269496	3.82774758
19	0.7250	26.519746	3.75055656
20	0.7500	24.938101	3.67805147
21	0.7750	23.503110	3.60979053
22	0.8000	22.196676	3.54538730
23	0.8250	21.003448	3.48450217
24	0.8500	19.910326	3.42683545
25	0.8750	18.906080	3.37212154
26	0.9000	17.981032	3.32012418
27	0.9250	17.126805	3.27063242
28	0.9500	16.336121	3.22345731
29	0.9750	15.602623	3.17842904
30	1.0000	14.920746	3.13539451

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU = 0.

31	1.0000	14.920746	3.13539451
32	1.0500	13.699772	3.05485803
33	1.1000	12.643268	2.98069349
34	1.1500	11.721455	2.91207707
35	1.2000	10.910777	2.84832311
36	1.2500	10.192801	2.78886288
37	1.3000	9.553108	2.73321900
38	1.3500	8.980317	2.68098545
39	1.4000	8.465274	2.63181314
40	1.4500	8.000446	2.58539915
41	1.5000	7.579481	2.54147923
42	1.6000	6.848422	2.46036163
43	1.7000	6.235951	2.38675952
44	1.8000	5.715241	2.31950125
45	1.9000	5.266439	2.25767592
46	2.0000	4.875089	2.20056349
47	2.1000	4.530634	2.14758238
48	2.2000	4.225190	2.09825286
49	2.3000	3.952681	2.05217239
50	2.4000	3.708281	2.00899896

NICKEL

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	14.920748	3.13539451
52	1.1000	13.267181	3.13539451
53	1.2000	11.971517	3.13539451
54	1.3000	10.924341	3.13539451
55	1.4000	10.059221	3.13539451
56	1.5000	9.333772	3.13538451
57	1.6000	8.717546	3.13539451
58	1.7000	8.186862	3.13539451
59	1.8000	7.723267	3.13539451
60	1.9000	7.312917	3.13539451
61	2.0000	6.945742	3.13539451
62	2.1000	6.614448	3.13539451
63	2.2000	6.313616	3.13539451
64	2.3000	6.039061	3.13539451
65	2.4000	5.787420	3.13539451
66	2.5000	5.555920	3.13539451
67	2.6000	5.342230	3.13539451
68	2.7000	5.144370	3.13539451
69	2.8000	4.960642	3.13539451
70	2.9000	4.789585	3.13539451
71	3.0000	4.629933	3.13539451

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13. ISENTROPE PRESSURES

	V/VU	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2250	814.034050	35.60250235
2	0.2500	678.333466	33.52240907
3	0.2750	576.393684	31.76923728
4	0.3000	497.576035	30.26580858
5	0.3250	435.176376	28.95828938
6	0.3500	384.789024	27.80768156
7	0.3750	343.419257	26.78501201
8	0.4000	308.952232	25.86825943
9	0.4250	279.887108	25.04035449
10	0.4500	255.107054	24.28783870
11	0.4750	233.777376	23.59994054
12	0.5000	215.261192	22.96792436
13	0.5250	199.065058	22.38462162
14	0.5500	184.801428	21.84408760
15	0.5750	172.162149	21.34134579
16	0.6000	160.899488	20.87219381
17	0.6250	150.812227	20.43305564
18	0.6500	141.735468	20.02086663
19	0.6750	133.532898	19.63298273
20	0.7000	126.090971	19.26710963
21	0.7250	119.314427	18.92124534
22	0.7500	113.122815	18.59363341
23	0.7750	107.447786	18.28272653
24	0.8000	102.230914	17.98715472
25	0.8250	97.422020	17.70570040
26	0.8500	92.977770	17.43727732
27	0.8750	88.860579	17.18091249
28	0.9000	85.037703	16.93573213
29	0.9250	81.480491	16.70094824
30	0.9500	78.163786	16.47584844
31	0.9750	75.065418	16.25978732
32	1.0000	72.165773	16.05217767

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU = 0.

33	1.0000	72.165773	16.05217767
34	1.0500	66.902700	15.66056418
35	1.1000	62.258317	15.29678631
36	1.1500	58.134474	14.95764267
37	1.2000	54.451993	14.64043975
38	1.2500	51.146701	14.34288418
39	1.3000	48.166265	14.06300807
40	1.3500	45.467628	13.79910982
41	1.4000	43.015004	13.54970801
42	1.4500	40.778313	13.31350529
43	1.5000	38.732010	13.08936012
44	1.6000	35.127782	12.67395127
45	1.7000	32.058235	12.29591417
46	1.8000	29.416759	11.94988644
47	1.9000	27.122381	11.63154626
48	2.0000	25.113112	11.33736491
49	2.1000	23.340926	11.06442416
50	2.2000	21.768049	10.81028211

NICKEL

EXPANSION PHASE — ISOENERGY ABOVE ESLIM

51	1.0000	72.165774	16.05217767
52	1.1000	65.300855	16.05217767
53	1.2000	59.663846	16.05217767
54	1.3000	54.944885	16.05217767
55	1.4000	50.933624	16.05217767
56	1.5000	47.482248	16.05217767
57	1.6000	44.481272	16.05217767
58	1.7000	41.846626	16.05217767
59	1.8000	39.512958	16.05217767
60	1.9000	37.429434	16.05217767
61	2.0000	35.556422	16.05217767
62	2.1000	33.862711	16.05217767
63	2.2000	32.323321	16.05217767
64	2.3000	30.917908	16.05217767
65	2.4000	29.629649	16.05217767
66	2.5000	28.444460	16.05217767
67	2.6000	27.350441	16.05217767
68	2.7000	26.337462	16.05217767
69	2.8000	25.396839	16.05217767
70	2.9000	24.521085	16.05217767
71	3.0000	23.703716	16.05217767

MOLYBDENUM

AC = 5   WC = 5

a = .5

BG	RHOIN	AMU	BMU	ESUBO
1.0200	10.2000	2.7130	1.6500	0.0450000

15   HUGONIOT PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	1.0000	0.	0.
2	0.9750	0.072051	0.00008830
3	0.9500	0.153468	0.00037614
4	0.9250	0.245795	0.00090365
5	0.9000	0.350845	0.00171982
6	0.8750	0.470750	0.00288450
7	0.8500	0.608031	0.00447082
3	0.8250	0.765678	0.00656831
9	0.8000	0.947264	0.00928690
10	0.7750	1.157090	0.01276202
11	0.7500	1.400380	0.01716152
12	0.7250	1.683547	0.02269487
13	0.7000	2.014543	0.02962562
14	0.6750	2.403345	0.03828858
15	0.6500	2.862627	0.04911370
16	0.6250	3.408695	0.06265984
17	0.6000	4.062812	0.07966297
18	0.5750	4.853115	0.10110656
19	0.5500	5.817443	0.12832593
20	0.5250	7.007585	0.16316680
21	0.5000	8.495870	0.20823208
22	0.4750	10.385642	0.26727753
23	0.4500	12.828544	C.34586758
24	0.4250	16.054126	0.45250596
25	0.4000	20.423090	0.60067905
26	0.3750	26.528684	0.81276599
27	0.3500	35.404122	1.12807241
28	0.3250	48.988059	1.62092830
29	0.3000	71.307600	2.44682923
30	0.2750	112.072597	3.98297188
31	0.2500	201.177423	7.39622825
32	0.2250	490.694977	18.64159679
33	0.2000	15606.000000	447.25000000

MOLYBDENUM

15. 1   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8750	0.470750	0.00288450
2	0.9000	0.353497	0.00188043
3	0.9250	0.249761	0.00114645
4	0.9500	0.157901	0.00065154
5	0.9750	0.076477	0.00036843
6	1.0000	0.004218	0.00027318

MOLYBDENUM

15. 2   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.7250	1.683547	0.02269487
2	0.7500	1.428205	0.01889630
3	0.7750	1.204021	0.01568321
4	0.8000	1.006698	0.01298489
5	0.8250	0.832638	0.01074022
6	0.8500	0.678805	0.00889613
7	0.8750	0.542623	0.00740641
8	0.9000	0.421885	0.00623066
9	0.9250	0.314692	0.00533347
10	0.9500	0.219395	0.00468378
11	0.9750	0.134555	0.00425426
12	1.0000	0.058909	0.00402092

MOLYBDENUM

15. 4   ISENTROPE PRESSURES

	V/VU	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.4250	16.054126	0.45250596
2	0.4500	13.845485	0.41608907
3	0.4750	12.019878	0.38456714
4	0.5000	10.495809	0.35711370
5	0.5250	9.212035	0.33307360
6	0.5500	8.121959	0.31192145
7	0.5750	7.189495	0.29323145
8	0.6000	6.386517	0.27665529
9	0.6250	5.690796	0.26190551
10	0.6500	5.084602	0.24874297
11	0.6750	4.553664	0.23696733
12	0.7000	4.086399	0.22640955
13	0.7250	3.673335	0.21692615
14	0.7500	3.306665	0.20839462
15	0.7750	2.979917	0.20070981
16	0.8000	2.687688	0.19378098
17	0.8250	2.425445	0.18752950
18	0.8500	2.189360	0.18188687
19	0.8750	1.976186	0.17679325
20	0.9000	1.783157	0.17219611
21	0.9250	1.607903	0.16804914
22	0.9500	1.448387	0.16431145
23	0.9750	1.302848	0.16094675
24	1.0000	1.169763	0.15792275

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   B**U =   0.

25	1.0000	1.169763	0.15792275
26	1.0500	0.953039	0.15280435
27	1.1000	0.812448	0.14823240
28	1.1500	0.712996	0.14426497
29	1.2000	0.643387	0.14072041
30	1.2500	0.592206	0.13748553
31	1.3000	0.551975	0.13449322
32	1.3500	0.518157	0.13170473
33	1.4000	0.488234	0.12909693
34	1.4500	0.460960	0.12665402
35	1.5000	0.435804	0.12436301
36	1.6000	0.390696	0.12002780
37	1.7000	0.353031	0.11623006
38	1.8000	0.321756	0.11285015
39	1.9000	0.295531	0.10979468
40	2.0000	0.273139	0.10699771
41	2.1000	0.253673	0.10441438
42	2.2000	0.236513	0.10201357
43	2.3000	0.221242	0.09977246
44	2.4000	0.207557	0.09767325
45	2.5000	0.195231	0.09570128
46	2.6000	0.184079	0.09384409
47	2.7000	0.173950	0.09209096
48	2.8000	0.164716	0.09043250
49	2.9000	0.156272	0.08886050
50	3.0000	0.148525	0.08736771

MOLYBDENUM

EXPANSION PHASE — ISOENERGY ABOVE ESLIM

51	1.0000	1.169763	0.15792275
52	1.1000	0.860709	0.15792275
53	1.2000	0.720163	0.15792275
54	1.3000	0.646742	0.15792275
55	1.4000	0.595087	0.15792275
56	1.5000	0.550946	0.15792275
57	1.6000	0.512008	0.15792275
58	1.7000	0.478342	0.15792275
59	1.8000	0.449555	0.15792275
60	1.9000	0.424751	0.15792275
61	2.0000	0.403010	0.15792275
62	2.1000	0.383625	0.15792275
63	2.2000	0.366122	0.15792275
64	2.3000	0.350184	0.15792275
65	2.4000	0.335588	0.15792275
66	2.5000	0.322163	0.15792275
67	2.6000	0.309772	0.15792275
68	2.7000	0.298299	0.15792275
69	2.8000	0.287645	0.15792275
70	2.9000	0.277726	0.15792275
71	3.0000	0.268469	0.15792275

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MOLYBDENUM

15. 5 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2750	112.072597	3.98297188
2	0.3000	94.066329	3.73299307
3	0.3250	80.176092	3.52131549
4	0.3500	69.228939	3.33956090
5	0.3750	60.442073	3.18164220
6	0.4000	53.277033	3.04303059
7	0.4250	47.353622	2.92028645
8	0.4500	42.397203	2.81075001
9	0.4750	38.205372	2.71233165
10	0.5000	34.626282	2.62336627
11	0.5250	31.544194	2.54251033
12	0.5500	28.869621	2.46866736
13	0.5750	26.532481	2.40093333
14	0.6000	24.477246	2.33855599
15	0.6250	22.659443	2.28090405
16	0.6500	21.043112	2.22744361
17	0.6750	19.598911	2.17771989
18	0.7000	18.302702	2.13134304
19	0.7250	17.134477	2.08797678
20	0.7500	16.077533	2.04732949
21	0.7750	15.117833	2.00914684
22	0.8000	14.243514	1.97320609
23	0.8250	13.444486	1.93931118
24	0.8500	12.712126	1.90728882
25	0.8750	12.039025	1.87698527
26	0.9000	11.418789	1.84826361
27	0.9250	10.845876	1.82100147
28	0.9500	10.315458	1.79508913
29	0.9750	9.823319	1.77042788
30	1.0000	9.365759	1.74692869

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU = 0.

31	1.0000	9.365759	1.74692869
32	1.0500	8.563164	1.70315528
33	1.1000	7.894859	1.66291514
34	1.1500	7.329560	1.62566893
35	1.2000	6.843023	1.59097910
36	1.2500	6.417180	1.55851060
37	1.3000	6.038951	1.52800332
38	1.3500	5.699053	1.49925053
39	1.4000	5.390939	1.47208303
40	1.4500	5.109930	1.44635808
41	1.5000	4.852562	1.42195219
42	1.6000	4.398593	1.37672460
43	1.7000	4.012023	1.33560175
44	1.8000	3.679967	1.29798681
45	1.9000	3.392151	1.26339646
46	2.0000	3.140497	1.23143820
47	2.1000	2.918738	1.20179044
48	2.2000	2.722006	1.17418566
49	2.3000	2.546458	1.14839898
50	2.4000	2.389010	1.12423907

MOLYBDENUM

EXPANSION PHASE -- ISOENERGY ABOVE ESLIN

51	1.0000	9.365759	1.74692869
52	1.1000	8.284720	1.74692869
53	1.2000	7.506183	1.74692869
54	1.3000	6.898099	1.74692869
55	1.4000	6.392345	1.74692869
56	1.5000	5.957584	1.74692869
57	1.6000	5.578668	1.74692869
58	1.7000	5.246026	1.74692869
59	1.8000	4.951978	1.74692869
60	1.9000	4.690056	1.74692869
61	2.0000	4.454998	1.74692869
62	2.1000	4.242646	1.74692869
63	2.2000	4.049728	1.74692869
64	2.3000	3.873632	1.74692869
65	2.4000	3.712225	1.74692869
66	2.5000	3.563735	1.74692869
67	2.6000	3.426668	1.74692869
68	2.7000	3.299754	1.74692869
69	2.8000	3.181906	1.74692869
70	2.9000	3.072185	1.74692869
71	3.0000	2.969779	1.74692869

MOLYBDENUM

15. 6 ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2250	490.694977	18.64159679
2	0.2500	409.810688	17.55053336
3	0.2750	348.745015	16.62995272
4	0.3000	301.389977	15.83923507
5	0.3250	263.771435	15.15098822
6	0.3500	233.321749	14.54503107
7	0.3750	208.270565	14.00631046
8	0.4000	187.370937	13.52334845
9	0.4250	169.722332	13.08722413
10	0.4500	154.660105	12.69088733
11	0.4750	141.684301	12.32868457
12	0.5000	130.412493	11.99602306
13	0.5250	120.547705	11.68912852
14	0.5500	111.856256	11.40486717
15	0.5750	104.152026	11.14061296
16	0.6000	97.285147	10.89414620
17	0.6250	91.133750	10.66357684
18	0.6500	85.597830	10.44728374
19	0.6750	80.594642	10.24386764
20	0.7000	76.055198	10.05211377
21	0.7250	71.921571	9.87096155
22	0.7500	68.144811	9.69948053
23	0.7750	64.683294	9.53685045
24	0.8000	61.501433	9.38234508
25	0.8250	58.568638	9.23531878
26	0.8500	55.858485	9.09519529
27	0.8750	53.348049	8.96145890
28	0.9000	51.017345	8.83364570
29	0.9250	48.848891	8.71133792
30	0.9500	46.827328	8.59415770
31	0.9750	44.939110	8.48176253
32	1.0000	43.172265	8.37384093

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU = 0.

33	1.0000	43.172265	8.37384093
34	1.0500	39.983298	8.17049086
35	1.1000	37.196788	7.98169529
36	1.1500	34.741013	7.80568063
37	1.2000	32.558995	7.64097977
38	1.2500	30.605370	7.48637342
39	1.3000	28.844902	7.34083730
40	1.3500	27.249759	7.20350039
41	1.4000	25.797441	7.07361305
42	1.4500	24.470047	6.95052272
43	1.5000	23.252791	6.83365625
44	1.6000	21.101941	6.61693180
45	1.7000	19.264161	6.41962296
46	1.8000	17.679491	6.23898578
47	1.9000	16.301582	6.07278889
48	2.0000	15.094292	5.91920006
49	2.1000	14.029232	5.77869919
50	2.2000	13.083870	5.64401263

MOLYBDENUM

EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	43.172266	8.37384093
52	1.1000	39.014990	8.37384093
53	1.2000	35.673634	8.37384093
54	1.3000	32.897595	8.37384093
55	1.4000	30.534024	6.37384093
56	1.5000	28.489441	8.37384093
57	1.6000	26.702100	8.37384093
58	1.7000	25.126820	8.37384093
59	1.8000	23.778249	8.37384093
60	1.9000	22.478091	8.37384093
61	2.0000	21.353627	8.37384093
62	2.1000	20.336576	8.37384093
63	2.2000	19.412116	8.37384093
64	2.3000	18.568090	8.37384093
65	2.4000	17.794414	8.373F4093
66	2.5000	17.082636	8.37384093
67	2.6000	16.425611	8.37384093
68	2.7000	15.817255	8.37384093
69	2.8000	15.252353	8.37384093
70	2.9000	14.726410	8.37384093
71	3.0000	14.235530	8.37384093

TH RIUM

AC = 9   NC = .88   a = .4

HG	RHOIN	AMU	3MU	ESUHO
C.8600	11.6800	0.5310	0.5000	0.0250000

17   HUGONIOT PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	1.0000	0.	0.
2	0.9750	0.014173	0.00001516
3	0.9500	0.030337	0.00006493
4	0.9250	0.048826	C.00015676
5	0.9000	0.070044	0.00029984
6	0.8750	0.094476	0.00050554
7	0.8500	0.122712	0.00078796
8	0.8250	0.155475	0.00116473
9	0.8000	0.193653	0.00165798
10	0.7750	0.238343	0.00229568
11	0.7500	0.290919	0.00311343
12	0.7250	0.353102	0.00415681
13	0.7000	0.427089	0.00548476
14	0.6750	0.515648	0.00717403
15	0.6500	0.622416	0.00932557
16	0.6250	C.752097	0.01207346
17	0.6000	0.910911	0.01559778
18	0.5750	1.107169	0.02014326
19	0.5300	1.352127	0.02604697
20	0.5250	1.661280	0.03377989
21	0.5000	2.056194	0.04401099
22	0.4750	2.567732	0.05770801
23	0.4500	3.240697	0.07630065
24	0.4250	4.141955	0.10195307
25	0.4000	5.374217	0.13802638
26	0.3750	7.100859	0.18998444
27	0.3500	9.593019	0.26692900
28	0.3250	13.325064	0.38503499
29	0.3000	19.185045	0.57489429
30	0.2750	28.992992	0.89982524
31	0.2500	46.991509	1.50871700
32	0.2250	85.278403	2.82922763
33	0.2000	194.079556	6.64655960
34	0.1750	1040.427292	36.74453974

THORIUM

18. 1   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.9250	0.048826	0.00015676
2	0.9500	0.030459	0.00007288
3	0.9750	0.014333	0.00002579
4	1.0000	0.000162	0.00001103

THORIUM

17. 1   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8750	0.094476	0.00050554
2	0.9000	0.070534	0.00033022
3	0.9250	0.049553	0.00020282
4	0.9500	0.031146	0.00011743
5	0.9750	0.014983	0.00006892
6	1.0000	0.000776	0.00005280

THORIUM

18. 2   ISENTROPE   PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.8250	0.155475	0.00116473
2	0.8500	0.124042	0.00088729
3	0.8750	0.096564	0.00063267
4	0.9000	0.072507	0.00045302
5	0.9250	0.051418	0.00032151
6	0.9500	0.032910	0.00023223
7	0.9750	0.016649	0.00018006
8	1.0000	0.002351	0.00016047

THORIUM

Fig. 2   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.7250	0.353102	0.00415681
2	0.7500	0.297175	0.00346408
3	0.7750	0.248626	0.00288270
4	0.8000	0.206374	0.00239809
5	0.8250	0.169517	0.00199781
6	0.8500	0.137802	0.00167119
7	0.8750	0.109090	0.00140900
8	0.9000	0.084345	0.00120329
9	0.9250	0.062608	0.00104716
10	0.9500	0.043488	0.00093462
11	0.9750	0.026651	0.00086043
12	1.0000	0.011807	0.00082004

THORIUM

Fig. 4   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.6250	0.752097	0.01207346
2	0.6500	0.645716	0.01058424
3	0.6750	0.554384	0.00930550
4	0.7000	0.475648	0.00820787
5	0.7250	0.407515	0.00726667
6	0.7500	0.348355	0.00646111
7	0.7750	0.296825	0.00577351
8	0.8000	0.251814	0.00518882
9	0.8250	0.212394	0.00469414
10	0.8500	0.177789	0.00427840
11	0.8750	0.147343	0.00393203
12	0.9000	0.120504	0.00364676
13	0.9250	0.096799	0.00341541
14	0.9500	0.075826	0.00323173
15	0.9750	0.057241	0.00309025
16	1.0000	0.040747	0.00298620
17	1.0250	0.026087	0.00291540
18	1.0500	0.013039	0.00287417
19	1.0750	0.001412	0.00285926

THORIUM

17. 3   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.5750	1.107169	0.02014326
2	0.6000	0.954722	0.01794694
3	0.6250	0.824825	0.01605095
4	0.6500	0.713572	0.01441250
5	0.6750	0.617835	0.01299260
6	0.7000	0.535099	0.01176366
7	0.7250	0.463315	0.01069933
8	0.7500	0.400809	0.00977809
9	0.7750	0.346200	0.00898167
10	0.8000	0.298344	0.00829447
11	0.8250	0.256287	0.00770314
12	0.8500	0.219230	0.00719618
13	0.8750	0.186497	0.00676365
14	0.9000	0.157519	0.00639696
15	0.9250	0.131809	0.00608860
16	0.9500	0.108954	0.00583206
17	0.9750	0.088598	0.00562163
18	1.0000	0.070435	0.00545231
19	1.0250	0.054200	0.00531969
20	1.0500	0.039666	0.00521992
21	1.0750	0.026634	0.00514957
22	1.1000	0.014929	0.00510563
23	1.1250	0.004402	0.00508542

THORIUM

17. 4   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.4250	4.141955	0.10195307
2	0.4500	3.558925	0.09376369
3	0.4750	3.079064	0.08670042
4	0.5000	2.680225	0.08056904
5	0.5250	2.345791	0.07521599
6	0.5500	2.063118	0.07051844
7	0.5750	1.822459	0.06637713
8	0.6000	1.616212	0.06271111
9	0.6250	1.438383	0.05945375
10	0.6500	1.284203	0.05654979
11	0.6750	1.149838	0.05395310
12	0.7000	1.032187	0.05162486
13	0.7250	0.928715	0.04953223
14	0.7500	0.837341	0.04764729
15	0.7750	0.756342	0.04594611
16	0.8000	0.684283	0.04440814
17	0.8250	0.619964	0.04301563
18	0.8500	0.562374	0.04175317
19	0.8750	0.510656	0.04060733
20	0.9000	0.464083	0.03956638
21	0.9250	0.422035	0.03862002
22	0.9500	0.383977	0.03775915
23	0.9750	0.349452	0.03697577
24	1.0000	0.318063	0.03626277

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU =   0.

25	1.0000	0.318063	0.03626277
26	1.0500	0.260949	0.03502767
27	1.1000	0.205096	0.03287193
28	1.1500	0.160143	0.03100099
29	1.2000	0.126785	0.02947550
30	1.2500	0.104031	0.02830417
31	1.3000	0.089739	0.02742771
32	1.3500	0.081415	0.02675852
33	1.4000	0.076816	0.02622263
34	1.4500	0.074221	0.02577101
35	1.5000	0.072471	0.02537418
36	1.6000	0.068714	0.02451943
37	1.7000	0.064451	0.02386649
38	1.8000	0.060231	0.02330774
39	1.9000	0.056016	0.02280437
40	2.0000	0.052177	0.02234057
41	2.1000	0.048741	0.02190902
42	2.2000	0.045670	0.02150545
43	2.3000	0.042915	0.02112674
44	2.4000	0.040433	0.02077042
45	2.5000	0.038188	0.02043427
46	2.6000	0.036148	0.02011640
47	2.7000	0.034288	0.01981516
48	2.8000	0.032586	0.01952918
49	2.9000	0.031024	0.01925712
50	3.0000	0.029586	0.01899787

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EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	0.318063	0.03626277
52	1.1000	0.223462	0.03626277
53	1.2000	0.157967	0.03626277
54	1.3000	0.124574	0.03626277
55	1.4000	0.111775	0.03626277
56	1.5000	0.106934	0.03626277
57	1.6000	0.103180	0.03626277
58	1.7000	0.098725	0.03626277
59	1.8000	0.093866	0.03626277
60	1.9000	0.089111	0.03626277
61	2.0000	0.084700	0.03626277
62	2.1000	0.080674	0.03626277
63	2.2000	0.077009	0.03626277
64	2.3000	0.073661	0.03626277
65	2.4000	0.070592	0.03626277
66	2.5000	0.067768	0.03626277
67	2.6000	0.065168	0.03626277
68	2.7000	0.062748	0.03626277
69	2.8000	0.060507	0.03626277
70	2.9000	0.058421	0.03626277
71	3.0000	0.056473	0.03626277

17. 5   ISENTROPE PRESSURES

	V/VO	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2750	28.992992	0.89962924
2	0.3000	24.096982	0.84367142
3	0.3250	20.350210	0.79656877
4	0.3500	17.421204	0.75648066
5	0.3750	15.089275	0.72193502
6	0.4000	13.203070	0.69184265
7	0.4250	11.656092	0.66528108
8	0.4500	10.371711	0.64191813
9	0.4750	9.293682	0.62096011
10	0.5000	8.380002	0.60211607
11	0.5250	7.598799	0.58507250
12	0.5500	6.925552	0.56957512
13	0.5750	6.341148	0.55541556
14	0.6000	5.830520	0.54242148
15	0.6250	5.381660	0.53044909
16	0.6500	4.984907	0.51937753
17	0.6750	4.632420	0.50910442
18	0.7000	4.317779	0.49954249
19	0.7250	4.035689	0.49061689
20	0.7500	3.781752	0.48226304
21	0.7750	3.552289	0.47442491
22	0.8000	3.344207	0.46705370
23	0.8250	3.154887	0.46010664
24	0.8500	2.982101	0.45354613
25	0.8750	2.823945	0.44733896
26	0.9000	2.678780	0.44145569
27	0.9250	2.545195	0.43587011
28	0.9500	2.421965	0.43055884
29	0.9750	2.308023	0.42550092
30	1.0000	2.202439	0.42067753

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU = 0.

31	1.0000	2.202439	0.42067753
32	1.0500	2.009150	0.41168028
33	1.1000	1.836926	0.40338756
34	1.1500	1.687086	0.39579362
35	1.2000	1.559019	0.38880409
36	1.2500	1.450749	0.38232924
37	1.3000	1.359387	0.37628942
38	1.3500	1.281699	0.37061793
39	1.4000	1.214602	0.36526169
40	1.4500	1.155487	0.36017989
41	1.5000	1.102361	0.35534171
42	1.6000	1.008948	0.34630553
43	1.7000	0.928139	0.33802360
44	1.8000	0.857321	0.33033939
45	1.9000	0.795009	0.32333420
46	2.0000	0.739977	0.31677528
47	2.1000	0.691142	0.31065930
48	2.2000	0.647578	0.30493736
49	2.3000	0.608513	0.29956786
50	2.4000	0.573323	0.29451519

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EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	2.202439	0.42067753
52	1.1000	1.910690	0.42067753
53	1.2000	1.683429	0.42067753
54	1.3000	1.519107	0.42067753
55	1.4000	1.399626	0.42067753
56	1.5000	1.305896	0.42067753
57	1.6000	1.226126	0.42067753
58	1.7000	1.155294	0.42067753
59	1.8000	1.091657	0.42067753
60	1.9000	1.034371	0.42067753
61	2.0000	0.982693	0.42067753
62	2.1000	0.935906	0.42067753
63	2.2000	0.893366	0.42067753
64	2.3000	0.854524	0.42067753
65	2.4000	0.818919	0.42067753
66	2.5000	0.786162	0.42067753
67	2.6000	0.755925	0.42067753
68	2.7000	0.727928	0.42067753
69	2.8000	0.701931	0.42067753
70	2.9000	0.677726	0.42067753
71	3.0000	0.655135	0.42067753

TABLE 6.   ISENTROPE PRESSURES

	V/V0	PRESSURE (MB)	ENERGY (MB-CC/GM)
1	0.2000	194.079556	6.64655960
2	0.2250	158.500696	6.27523631
3	0.2500	132.674355	5.96742976
4	0.2750	113.241970	5.70678890
5	0.3000	98.190725	5.48227590
6	0.3250	86.251861	5.28615052
7	0.3500	76.591536	5.11280960
8	0.3750	68.662173	4.95808685
9	0.4000	62.005742	4.81881273
10	0.4250	56.395845	4.59252783
11	0.4500	51.601757	4.57729077
12	0.4750	47.465370	4.47154588
13	0.5000	43.865985	4.37402970
14	0.5250	40.710040	4.28370410
15	0.5500	37.923995	4.19970691
16	0.5750	35.449338	4.12131518
17	0.6000	33.238987	4.04791754
18	0.6250	31.254670	3.97899288
19	0.6500	29.464986	3.91409388
20	0.6750	27.843957	3.85283402
21	0.7000	26.369917	3.79487729
22	0.7250	25.024673	3.73993003
23	0.7500	23.792838	3.68773422
24	0.7750	22.661329	3.63806206
25	0.8000	21.618945	3.59071162
26	0.8250	20.656057	3.54550311
27	0.8500	19.764338	3.50227582
28	0.8750	18.936558	3.46088564
29	0.9000	18.166408	3.42120287
30	0.9250	17.448363	3.38311037
31	0.9500	16.777566	3.34850213
32	0.9750	16.149728	3.31128183
33	1.0000	15.561053	3.27736181

EXPANSION PHASE - ISENTROPE ABOVE ESLIM   BMU = 0.

34	1.0000	15.561053	3.27736181
35	1.0500	14.484008	3.21316487
36	1.1000	13.523855	3.15330523
37	1.1500	12.667675	3.09732407
38	1.2000	11.903466	3.04480258
39	1.2500	11.219810	2.99537176
40	1.3000	10.605941	2.94871017
41	1.3500	10.052000	2.90454084
42	1.4000	9.549301	2.86262570
43	1.4500	9.090476	2.82276514
44	1.5000	8.669465	2.78478232
45	1.6000	7.922574	2.71396616
46	1.7000	7.279419	2.64905825
47	1.8000	6.720353	2.58926678
48	1.9000	6.230775	2.53394106
49	2.0000	5.799203	2.48253989
50	2.1000	5.416425	2.43460965

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EXPANSION PHASE - ISOENERGY ABOVE ESLIM

51	1.0000	15.561053	3.27736181
52	1.1000	14.050799	3.27736181
53	1.2000	12.808937	3.27736181
54	1.3000	11.787089	3.27736181
55	1.4000	10.933343	3.27736181
56	1.5000	10.203690	3.27736181
57	1.6000	9.567691	3.27736181
58	1.7000	9.003145	3.27736181
59	1.8000	8.506342	3.27736181
60	1.9000	8.058807	3.27736181
61	2.0000	7.655908	3.27736181
62	2.1000	7.291348	3.27736181
63	2.2000	6.959925	3.27736181
64	2.3000	6.657319	3.27736181
65	2.4000	6.379931	3.27736181
66	2.5000	6.124734	3.27736181
67	2.6000	5.889167	3.27736181
68	2.7000	5.671050	3.27736181
69	2.8000	5.468512	3.27736181
70	2.9000	5.279943	3.27736181
71	3.0000	5.103945	3.27736181

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